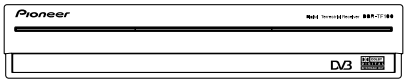
Pioneer sound.vision.soul

Service Manual



DBR-TF100

ORDER NO.
ARP3204

Digital Terrestrial Receiver

DBR-TF100

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Remarks
DBR-TF100	NYXKEW	AC220-230V	

- **When servicing the PCB Assy, handle with full care.**
  Refer to "7.4 CAUTION FOR PCB ASSY SERVICING" for details.

For details, refer to "Important symbols for good services".

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
ⓒ**PIONEER CORPORATION 2004**

T-ZZK MAY 2004 printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

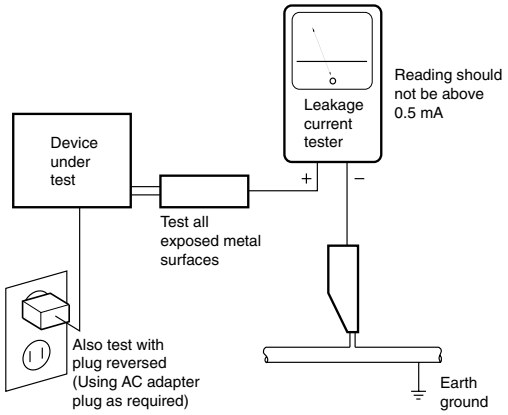
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.


Leakage current tester
Reading should not be above 0.5 mA
Device under test
+
–
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

[Important symbols for good services]
In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely.
When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments

To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning

For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws

To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts

Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount.For replacement parts or tools, the prescribed ones should be used.

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1. SPECIFICATIONS

System capabilities
DVB compliant MPEG-2 reception of broadcasts up to Main Profile @ Main Level

Video decoding
• DVB compliant MPEG-2 reception of broadcasts up to Main Profile @ Main Level
• Video bit rate: up to 15 Mbit/sec
• Video format: 4:3 and 16:9
• Resolution: up to 720 by 576 pixels

Audio decoding
MPEG layer I/II (excluding multichannel management from one bit stream)

Operation/Features
• Automatic programme loading via scanning installation
• Free to air reception
• DVB subtitles
• Programme parental lock with PIN code
• Full remote
• Menu controlled operation using on-screen display
• Menu controlled installation using on-screen display
• 10 events programme timer
• Video still image capture
• Multibrand TV remote
• 5 V Power to active indoor antenna; 100 mA max

Reception-Demodulation
Demodulation conforming to ETSI EN 300 744 (COFDM)
• supports FFT size 2k and 8k, in 7 MHz and 8 MHz bandwidth.
• MFN and SFN network supported.
• All non-hierarchical modes supported.

Connections
• RF input (for aerial) connector: female IEC 169-25
Tuner frequency range: VHF Band III (170 to 230 MHz) and UHF Band IV, V (470 to 862 MHz)
• RF output (to TV) connector: male IEC 169-2
Loopthrough frequency range: 47-862 MHz (VHF, UHF CH21 to 69)
RF modulator: Standard PAL I, G, K, L
Channel: selectable UHF ch 21 to 69. (Default: ch 43)
• TV SCART
Output: CVBS, Controlled audio L/R, RGB, S-VIDEO
• VCR SCART
Input: CVBS, Audio L/R, S-VIDEO, RGB
Output: CVBS, Audio L/R, S-VIDEO
• Optical digital audio output

Accessories
• Remote control
• Aerial/RF lead
• SCART lead
• Instruction manuals
• Warranty card
• Batteries: 2 x 1.5V type AA/R06/UM-3
• Mains lead

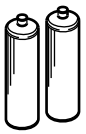
Miscellaneous
• Operating Temperature: +5 ˚C to 40 ˚C
• Mains: 220–240 V, 50 Hz
• Power consumption: 10 W max
• Standby consumption: 4 W max
• Weight: 1.1 kg
• Dimensions: 260 (W) x 50 (H) x 190 (D) mm

Specifications and design are subject to possible modifications without notice due to improvements.

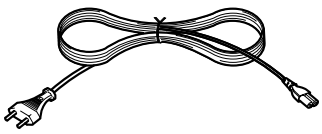
● Accessories

□ **Remote control** (XXD1003)

□ **Two AA/R06 Batteries**

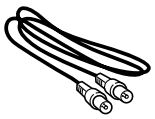


□ **Mains lead** (ADG1154)



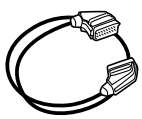
This is provided separately. Plug it into the mains power supply.

□ **Aerial/RF lead** (BDE1064)



Connects the Digital Terrestrial Receiver (DTR) box to the video or TV.

□ **SCART lead** (BDH1039)



Connects the DTR SCART socket to the TV SCART socket. (TV SCART sockets are usually labelled EXT or AV.)

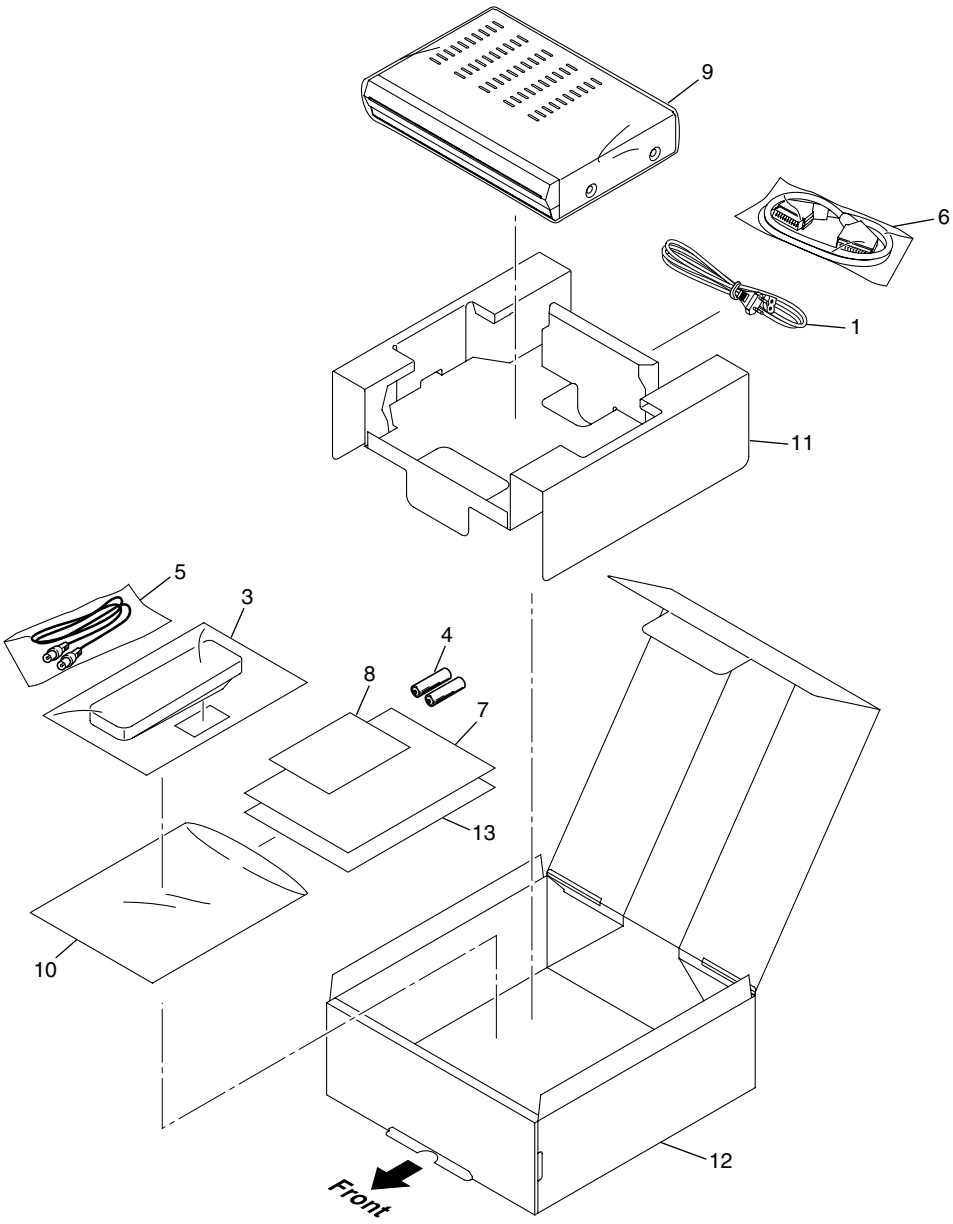
□ **Instruction manuals**

□ **Warranty card**

2. EXPLODED VIEWS AND PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screws adjacent to ▼ mark on product are used for disassembly.*
- *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions, apply as you think it appropriate.)*

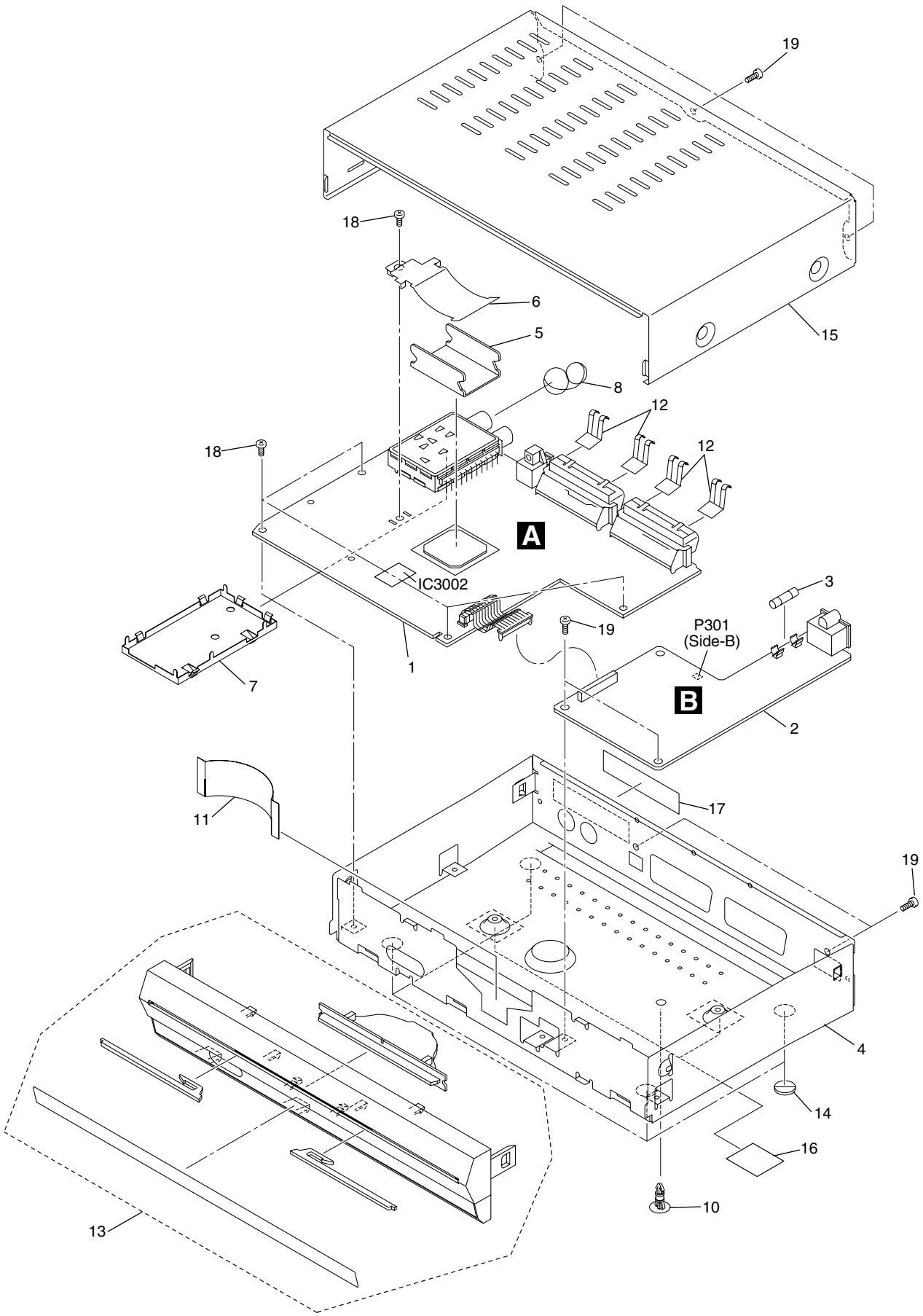
2.1 PACKING



Mark	No.	Description	Part No.
⚠	1	Mains Lead	ADG1154
	2	••••••	
	3	Remote Control	XXD1003
NSP	4	Battery(AA/R06)	VEM1017
	5	Aerial/RF Lead	BDE1064
	6	SCART Lead	BDH1039
	7	Instruction Manual (German/Spanish)	XRB1015
NSP	8	Warranty Card	XRY1008
	9	Sheet	AHG1153

Mark	No.	Description	Part No.
NSP	10	Catalogue Bag	BHG1047
	11	Card Board Insert	XHB1006
	12	Packing Case	XHD1028
	13	Instruction Manual (English/French/Italian)	XRB1016

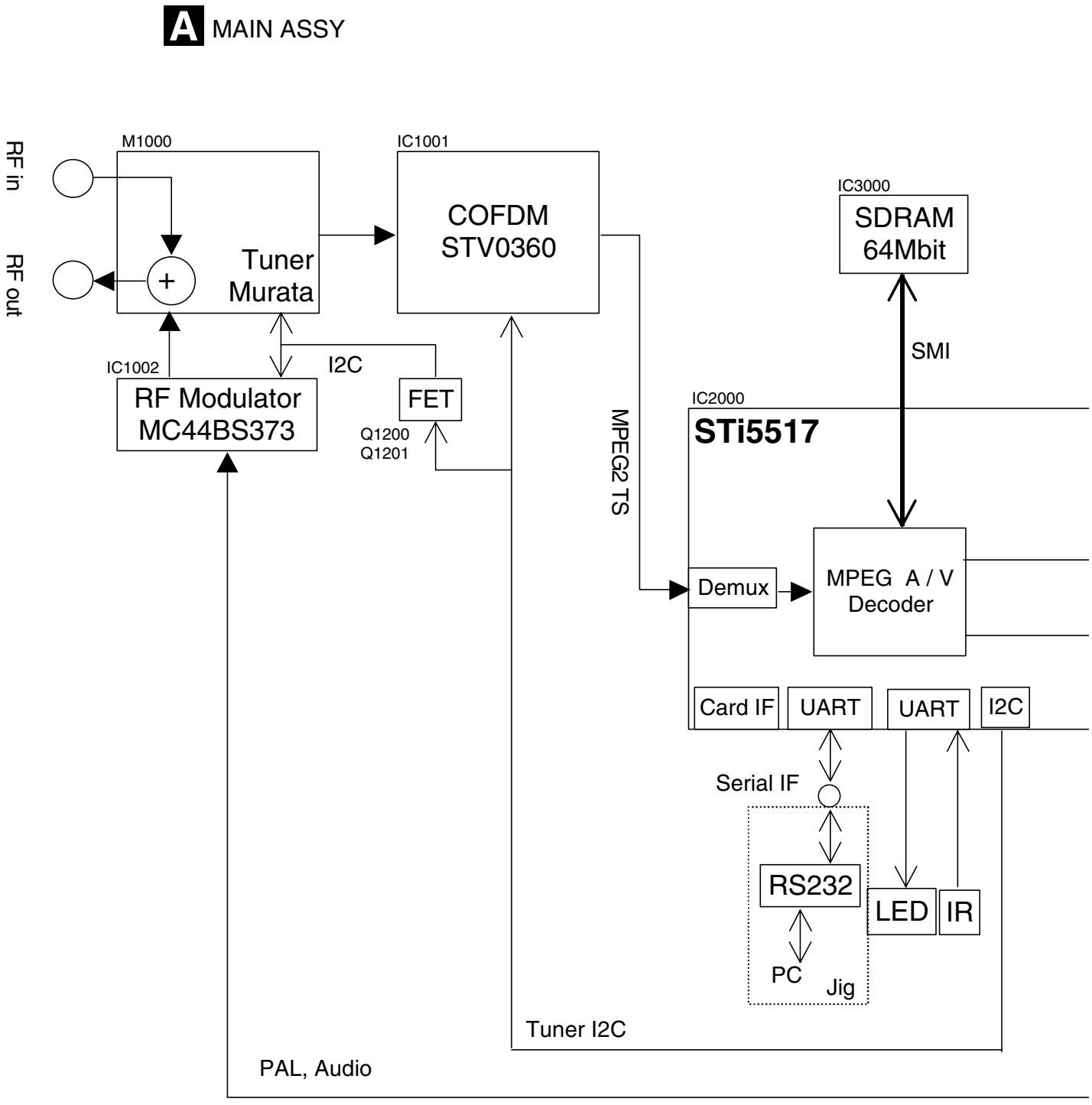
2.2 EXTERIOR SECTION

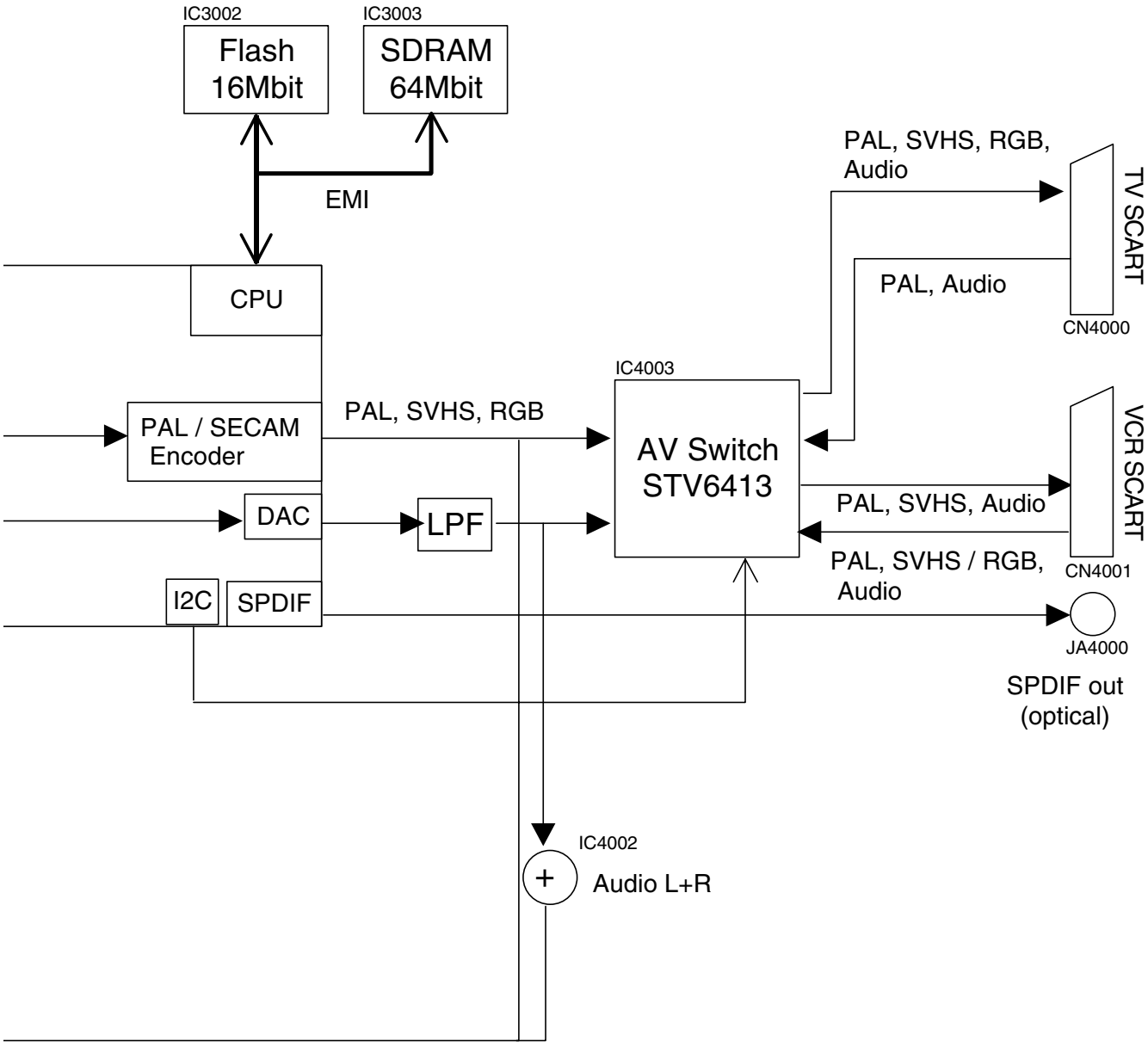


Mark	No.	Description	Part No.
	1	MAIN ASSY	XWE1011
⚠	2	POWER ASSY	XXF1004
⚠	3	Fuse (F101 : T2A)	AEK1057
	4	Chassis Assy	XWX1016
	5	Heat Sink	BNH1061
	6	Heat Sink	XNH1002
	7	Tuner Bottom Can	XNB1004
	8	Tuner Spring	XBH1003
	9	••••••	
	10	Spacer	XEC1001
	11	Light Shield	XEC1002
	12	Ground Plate	BBK1004
	13	Front Panel Assy	XWX1007
	14	Foot	XMR1006
	15	Bonnet	XNE1006
	16	Protect Label	BAX1302
NSP	17	Bar Code Label	XAL1015
	18	Screw	BBZ30P060FZK
	19	Screw	BBZ30P080FZK

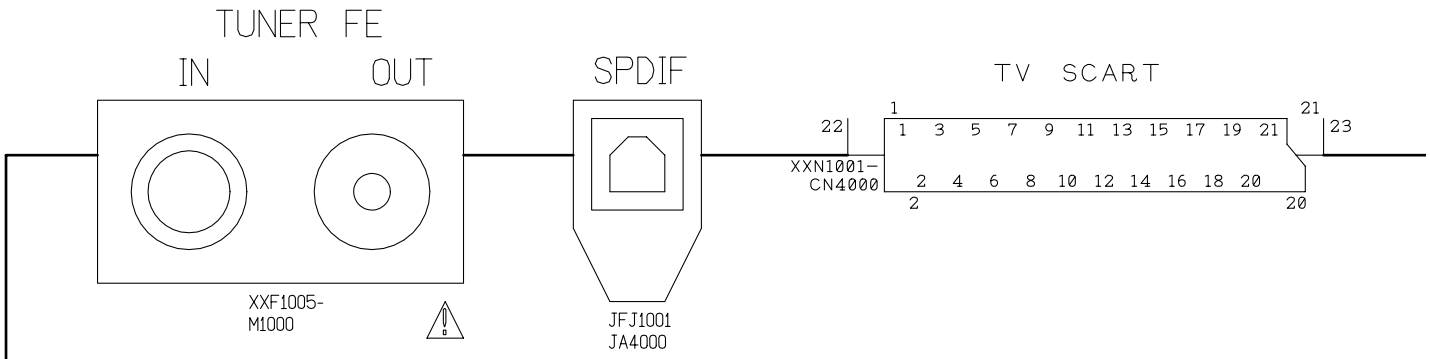
3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM




IC3002
Flash
16Mbit
IC3003
SDRAM
64Mbit
EMI
CPU
PAL / SECAM
Encoder
DAC
LPF
I2C
SPDIF
PAL, SVHS, RGB
IC4003
AV Switch
STV6413
PAL, SVHS, RGB,
Audio
TV SCART
CN4000
PAL, Audio
PAL, SVHS, Audio
VCR SCART
CN4001
PAL, SVHS / RGB,
Audio
JA4000
SPDIF out
(optical)
IC4002
+
Audio L+R

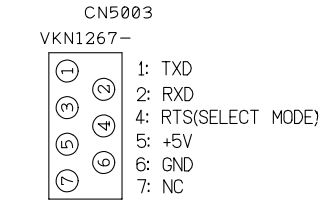
3.2 OVERALL WIRING CONNECTION DIAGRAM



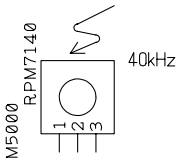
A (**A** 1/5 - **A** 5/5)

MAIN ASSY
(XWE1011)

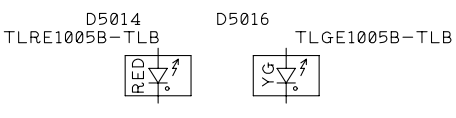
For inspection software



PCB
XNP1011-

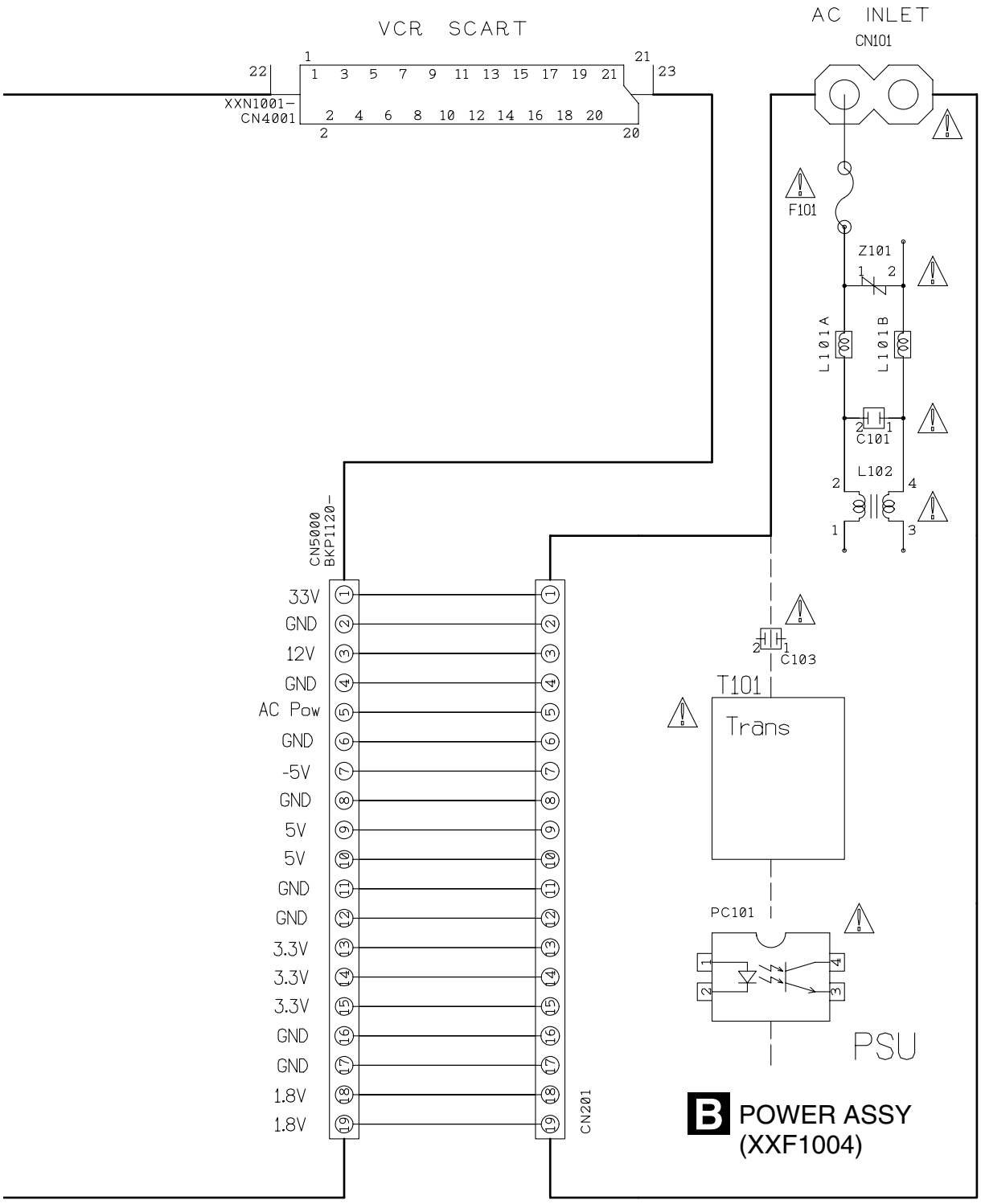


IR SENSOR

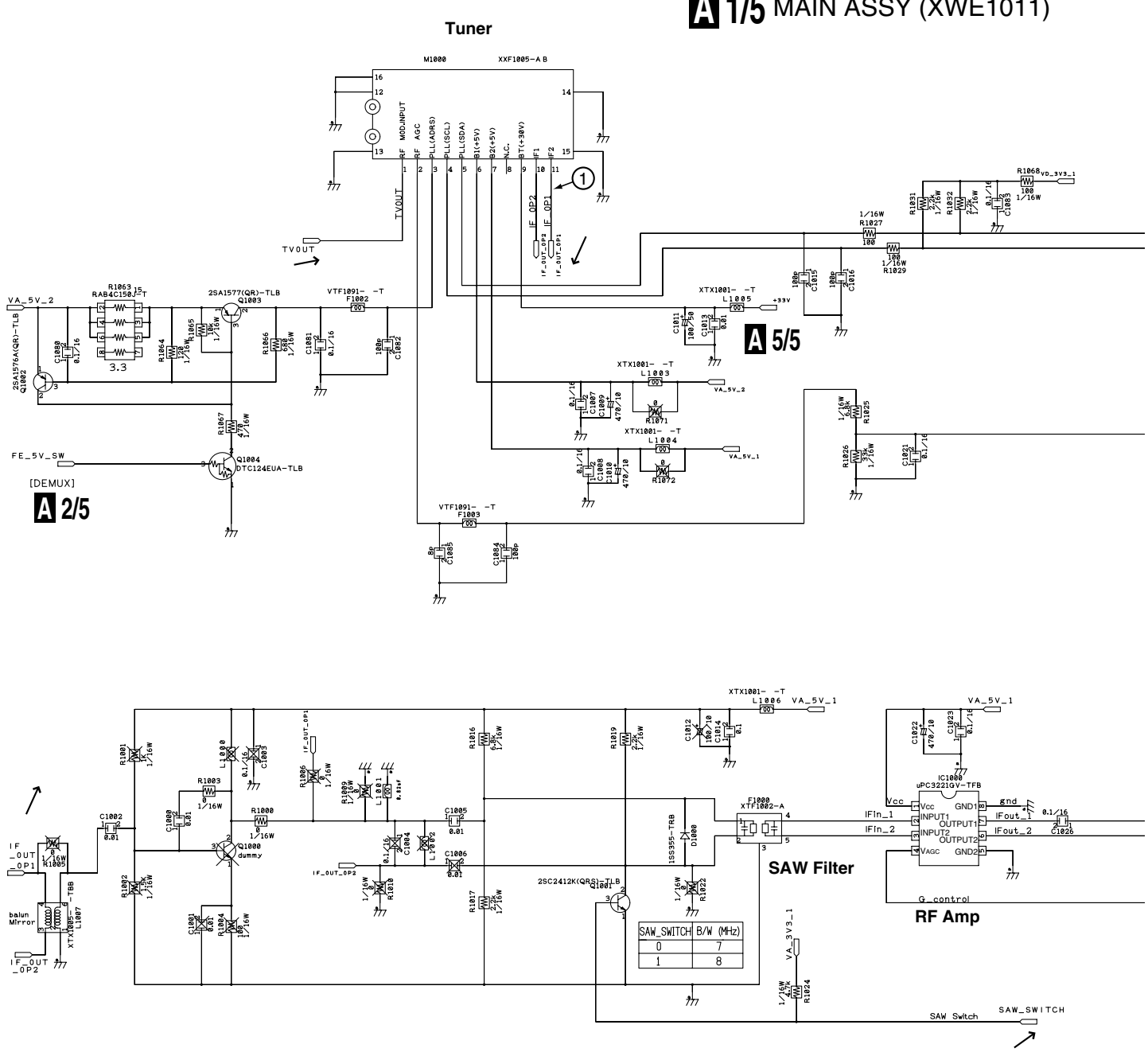


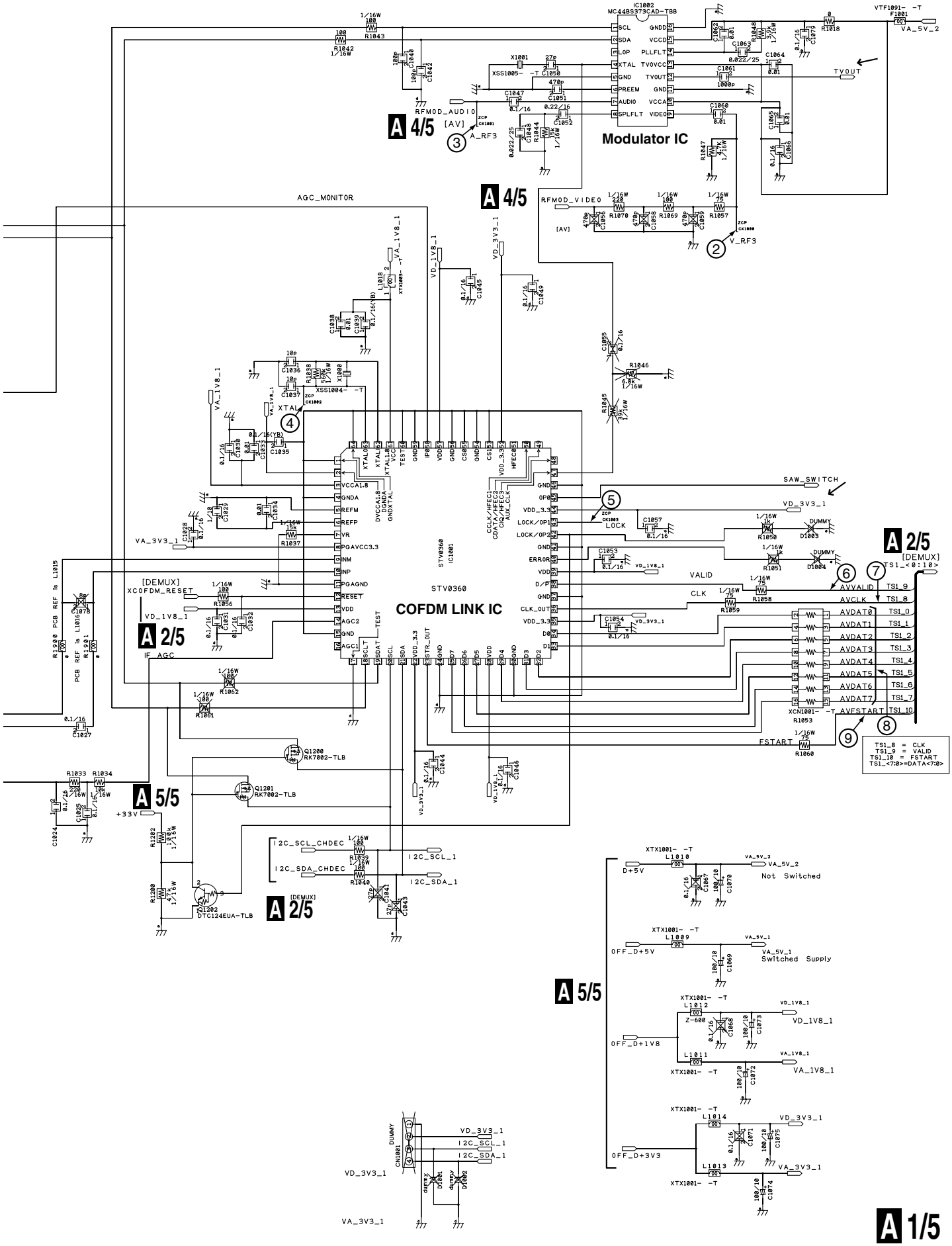
LED INDICATOR

NOTES: • When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
• The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• ⬭ : The power supply is shown with the marked box.

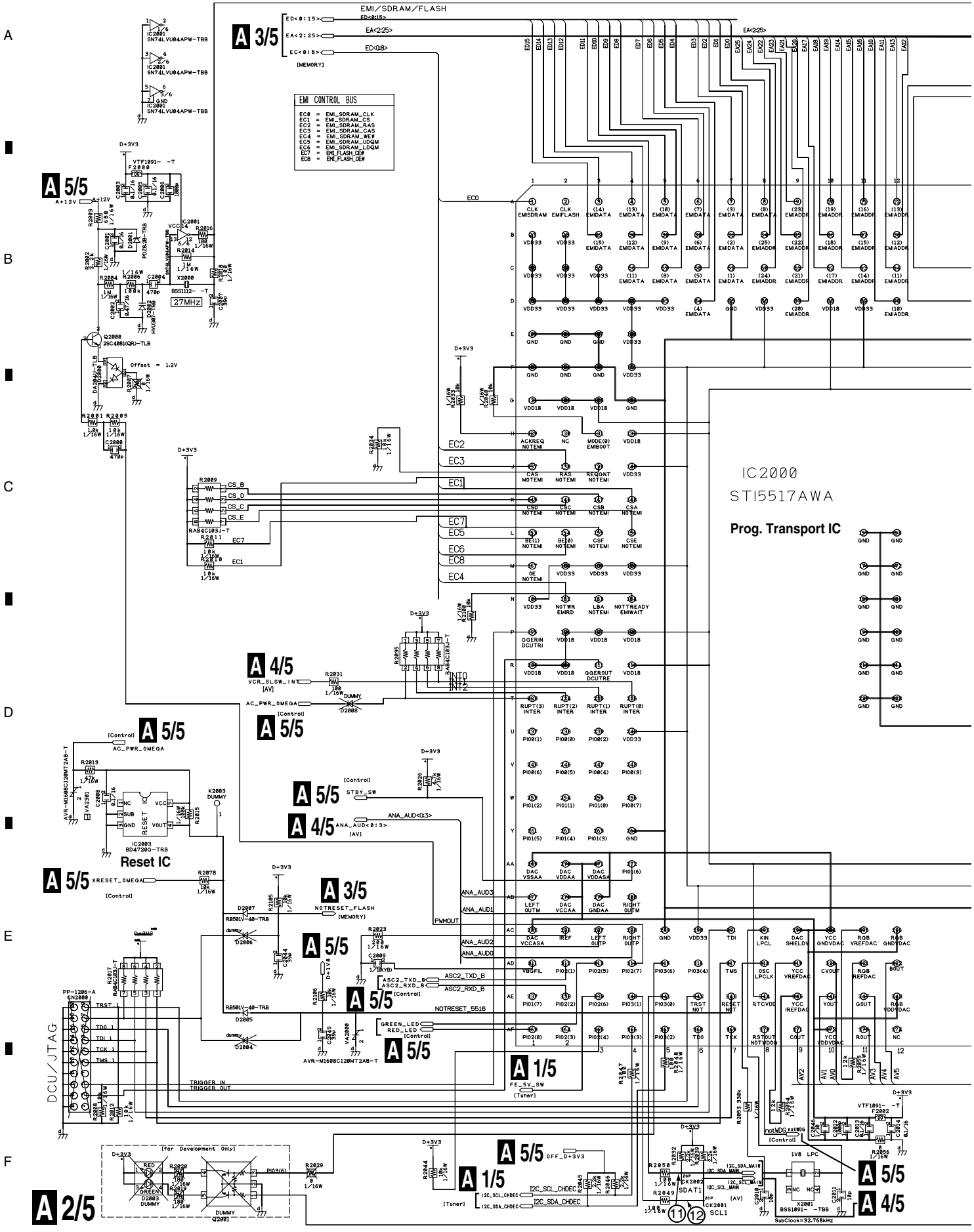


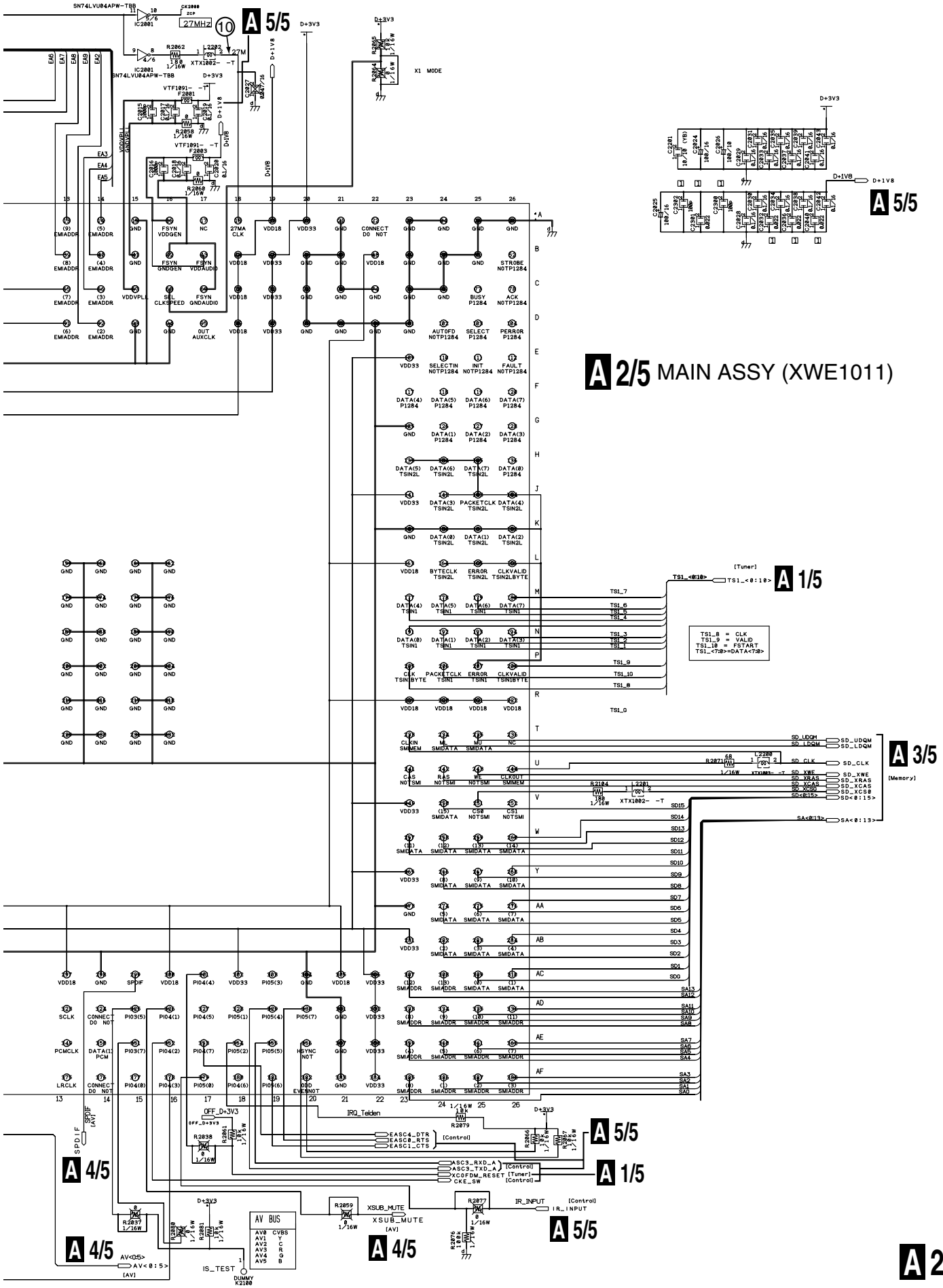
3.3 MAIN ASSY (1/5)




Modulator IC
COFDM LINK IC
STV0360
IC1001
IC1002
MC44BS373CAD-TBB
AGC_MONITOR
RFMOD_AUDIO
RFMOD_VIDEO
A_RF3
V_RF3
XTAL
XSS1004- -T
XSS1005- -T
XTX1001- -T
LOCK
SAW_SWITCH
VALID
CLK
FSTART
AVVALID
AVCLK
AVDAT0
AVDAT1
AVDAT2
AVDAT3
AVDAT4
AVDAT5
AVDAT6
AVDAT7
AVFSTART
TS1_9
TS1_8
TS1_0
TS1_1
TS1_2
TS1_3
TS1_4
TS1_5
TS1_6
TS1_7
TS1_10
TS1_8 = CLK
TS1_9 = VALID
TS1_10 = FSTART
TS1_<7:0>=DATA<7:0>
XCOFDM_RESET
IF_AGC
I2C_SCL_CHDEC
I2C_SDA_CHDEC
I2C_SCL_1
I2C_SDA_1
Q1200 RK7002-TLB
Q1201 RK7002-TLB
Q1202 DTC124EUA-TLB
+33V
D+5V
Not Switched
0FF_D+5V
VA_5V_1
Switched Supply
0FF_D+1V8
VD_1V8_1
0FF_D+3V3
VA_3V3_1
VD_3V3_1
TVOUT
VTF1091- -T
F1001
VA_5V_2
A 4/5
A 2/5
A 5/1
A 1/5
[AV]
[DEMUX]

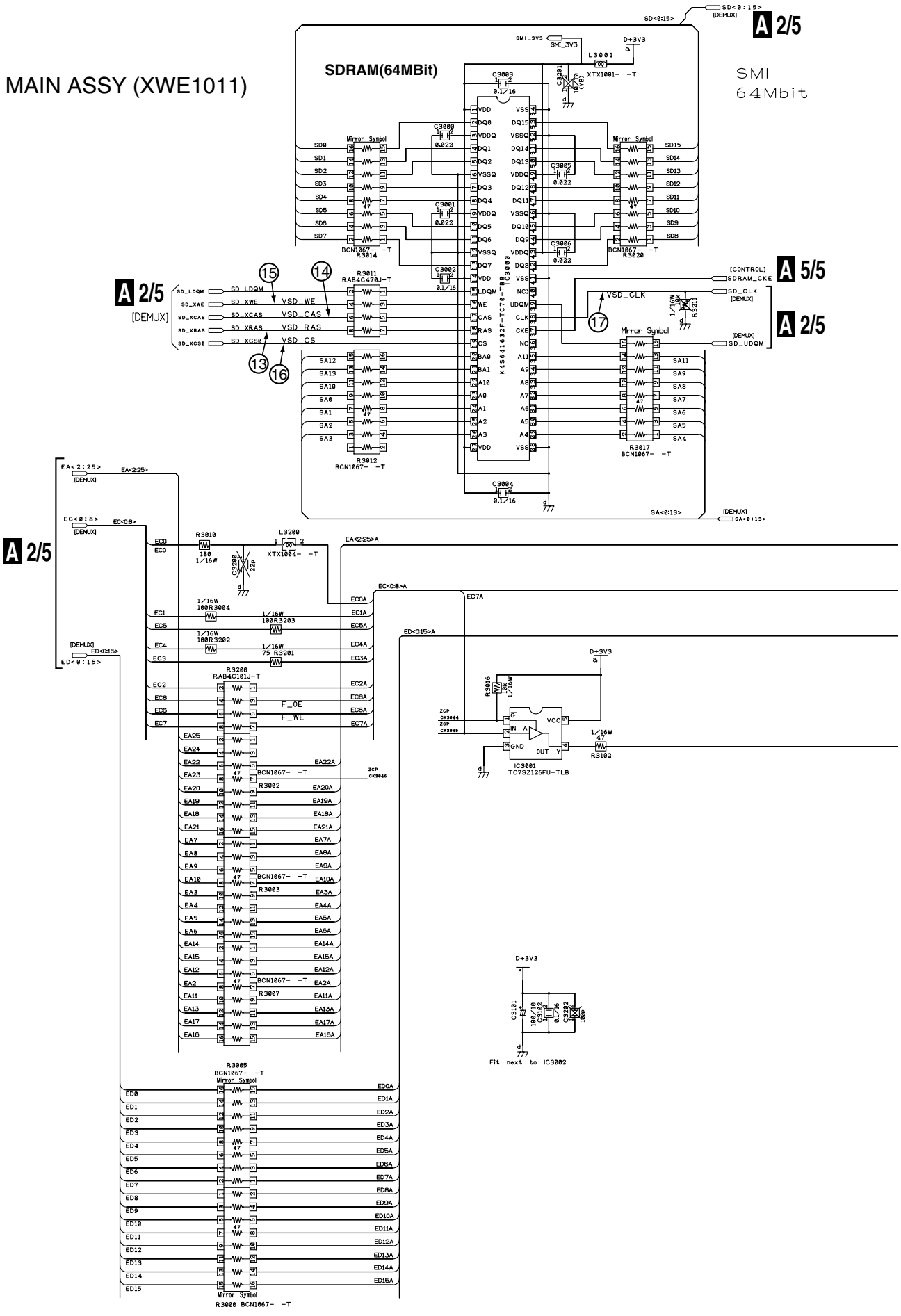
3.4 MAIN ASSY (2/5)

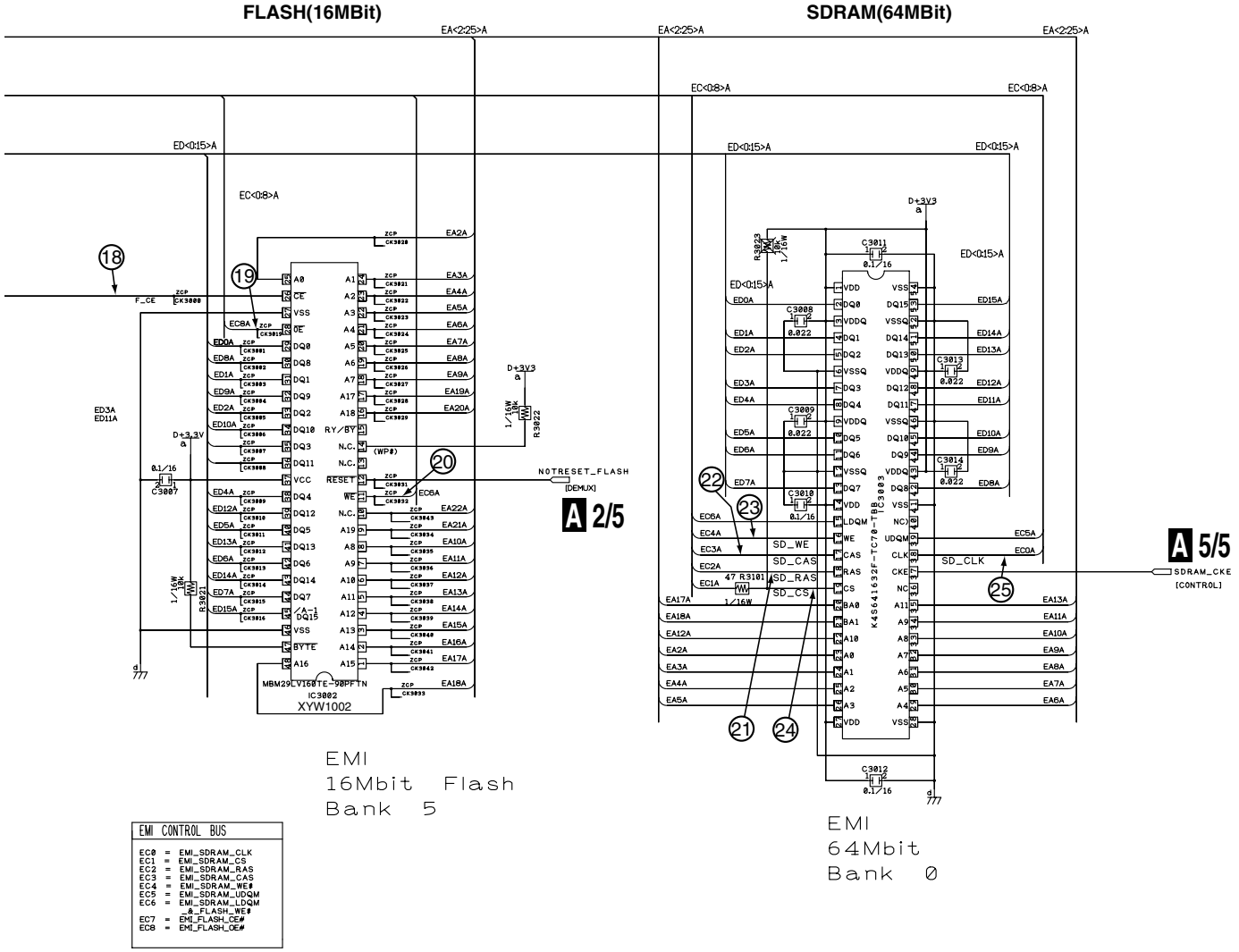



A 2/5 MAIN ASSY (XWE1011)
A 5/5
A 1/5
A 3/5
A 4/5
A 2/5
[Tuner]
[Memory]
[Control]
[AV]
TS1_8 = CLK
TS1_9 = VALID
TS1_10 = FSTART
TS1_<7:0>=DATA<7:0>
IRQ_Telden
XSUB_MUTE
IR_INPUT
AV BUS
SD_UDQM
SD_LDQM
SD_CLK
SD_XWE
SD_XRAS
SD_XCAS
SD_XCS0
SD<0:15>
SA<0:13>
SPDIF
X1 MODE

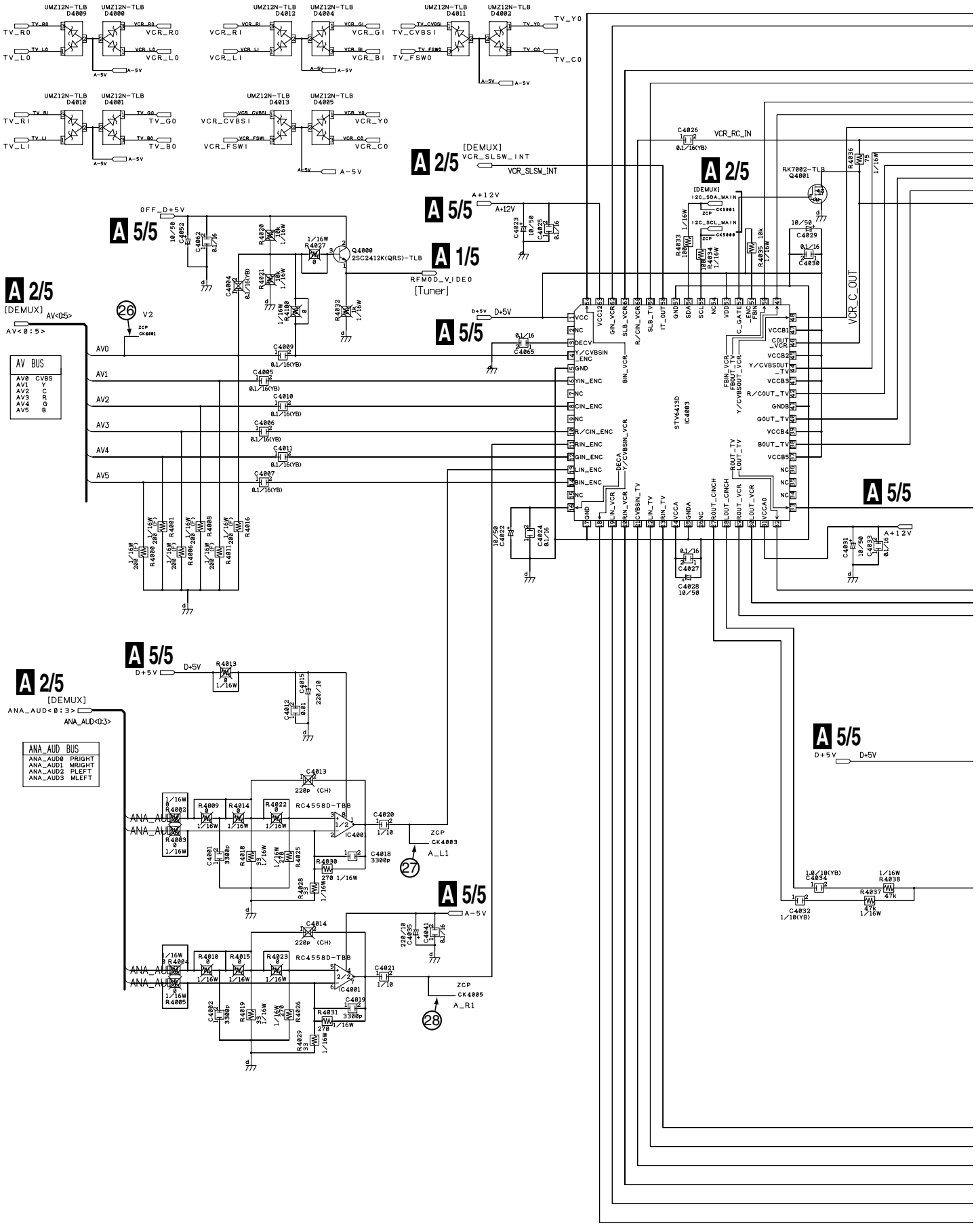
3.5 MAIN ASSY (3/5)

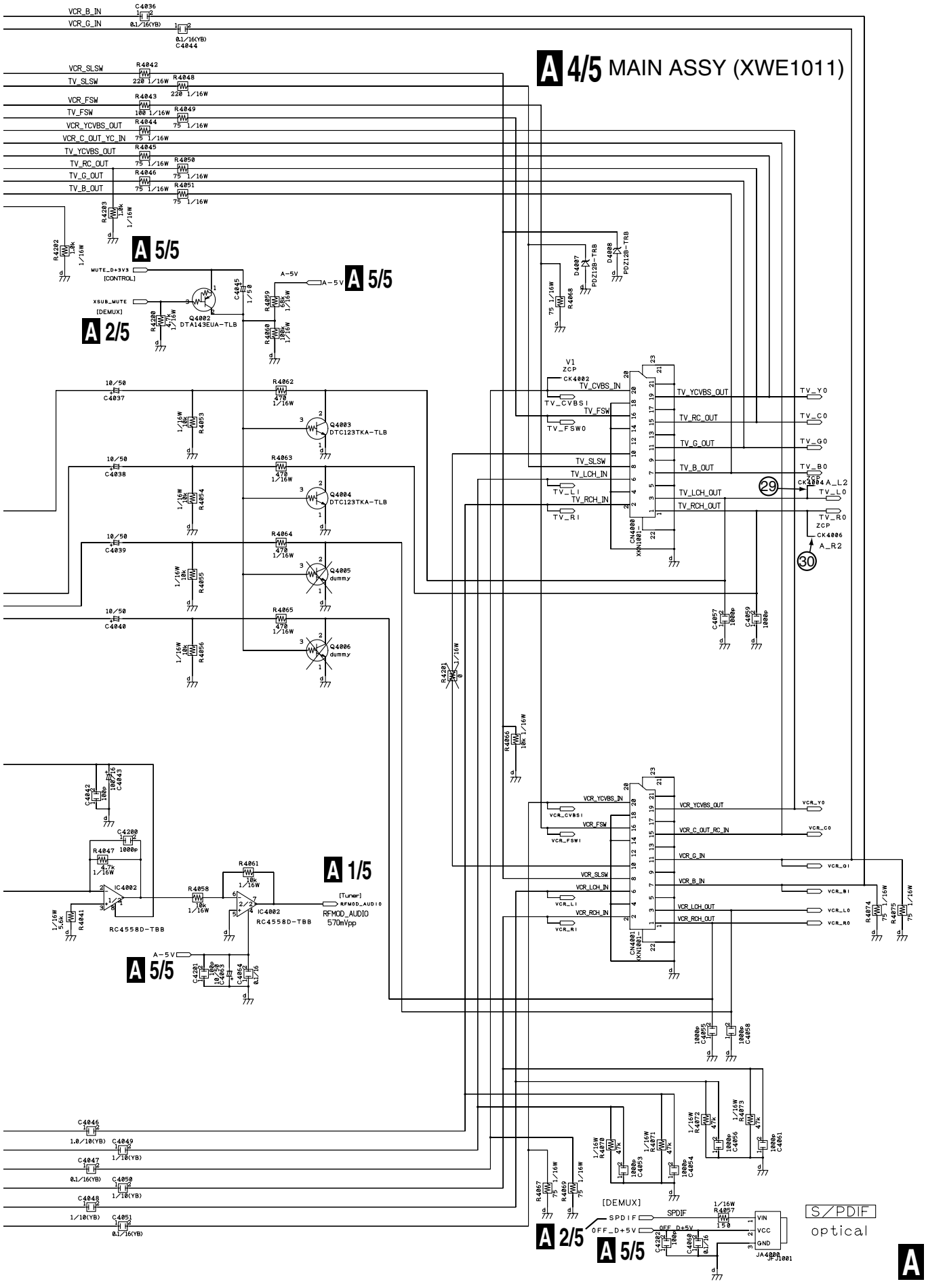
A 3/5 MAIN ASSY (XWE1011)



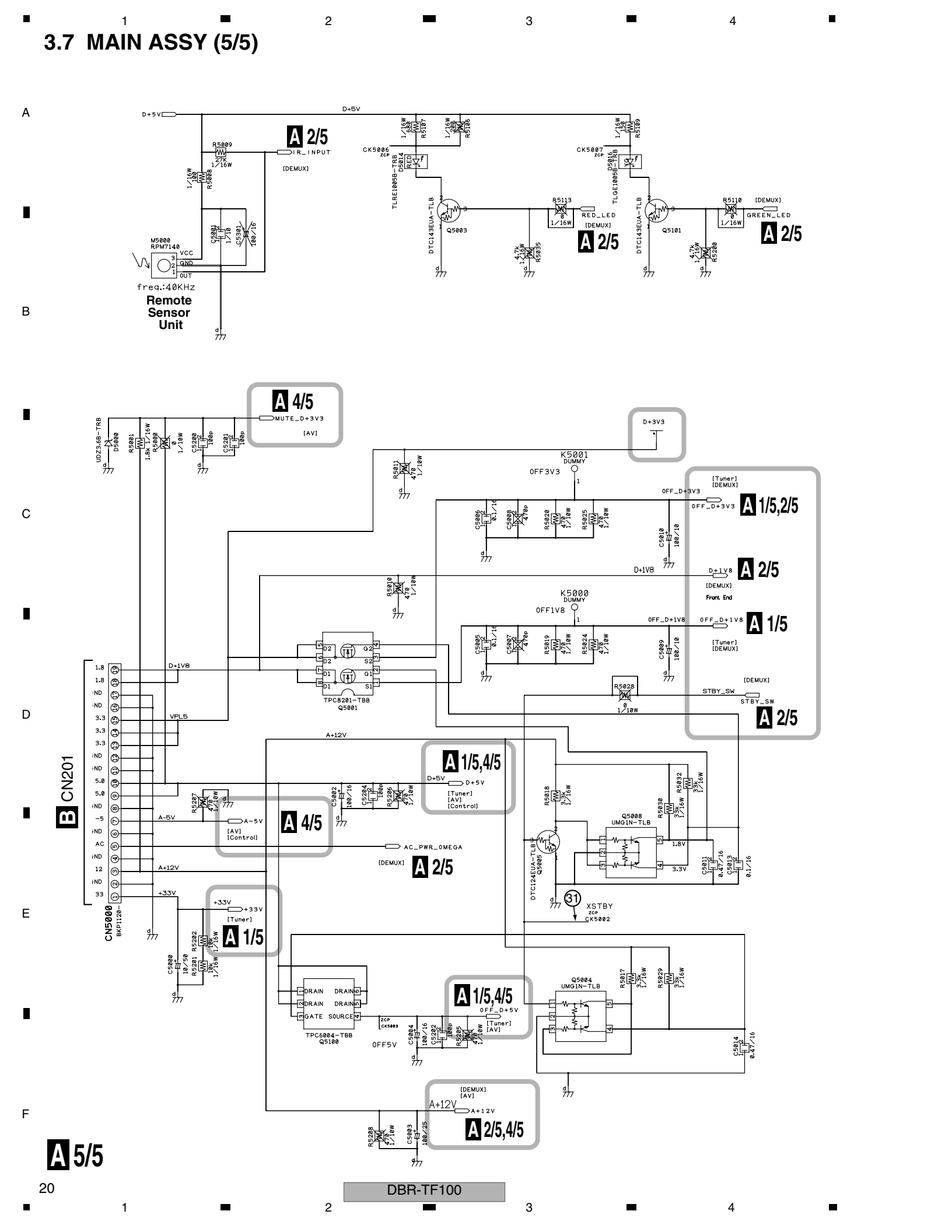

FLASH(16MBit)
SDRAM(64MBit)
EA<2:25>A
EC<0:8>A
ED<0:15>A
F_CE
N0TRESET_FLASH
[DEMUX]
A 2/5
A 5/5
A 3/5
SDRAM_CKE
[CONTROL]
SD_CLK
SD_WE
SD_CAS
SD_RAS
SD_CS
MBM29LV160TE-90PFTN
IC3002
XYW1002
K4S641632F-TC70-TBB
IC3003
EMI
16Mbit Flash
Bank 5
EMI
64Mbit
Bank 0
EMI CONTROL BUS
EC0 = EMI_SDRAM_CLK
EC1 = EMI_SDRAM_CS
EC2 = EMI_SDRAM_RAS
EC3 = EMI_SDRAM_CAS
EC4 = EMI_SDRAM_WE#
EC5 = EMI_SDRAM_UDQM
EC6 = EMI_SDRAM_LDQM
_&_FLASH_WE#
EC7 = EMI_FLASH_OE#
EC8 = EMI_FLASH_OE#

3.6 MAIN ASSY (4/5)

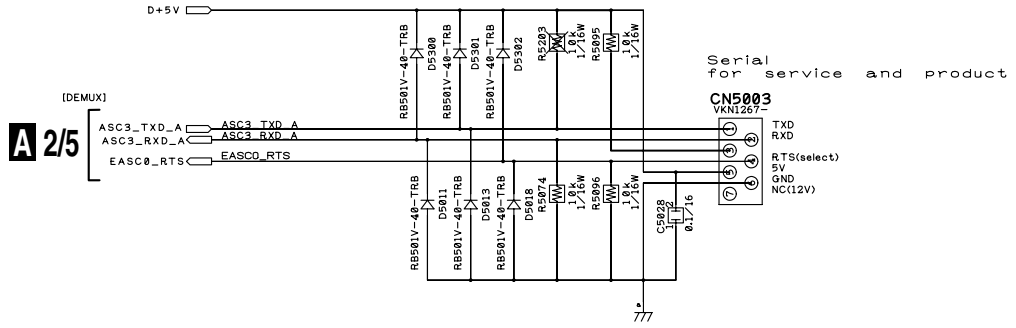


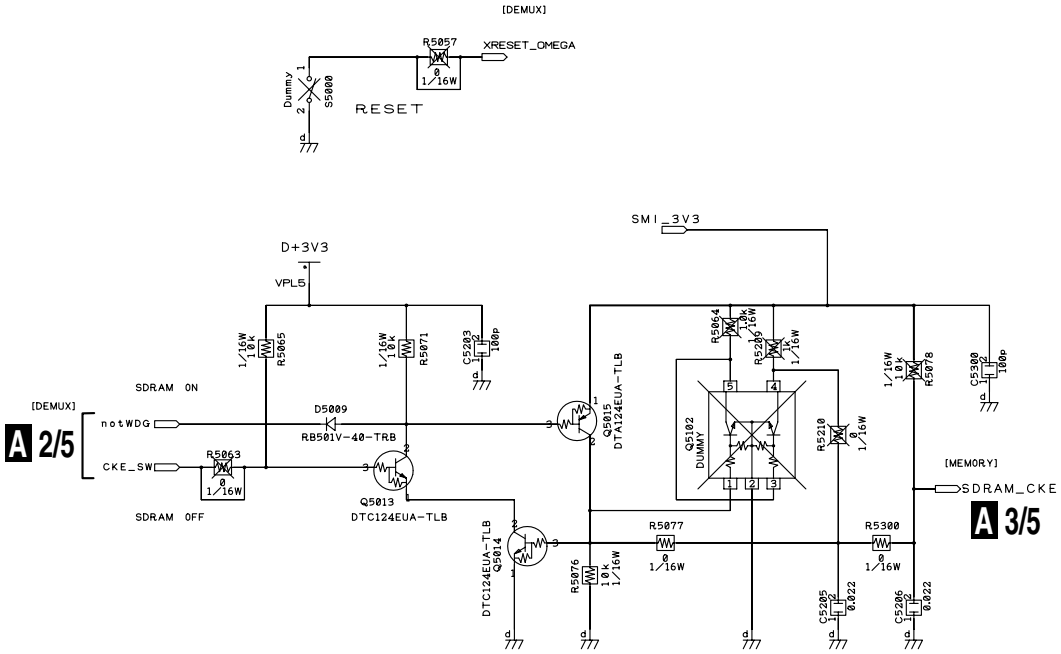

A 4/5 MAIN ASSY (XWE1011)
VCR_B_IN
VCR_G_IN
VCR_SLSW
TV_SLSW
VCR_FSW
TV_FSW
VCR_YCVBS_OUT
VCR_C_OUT_YC_IN
TV_YCVBS_OUT
TV_RC_OUT
TV_G_OUT
TV_B_OUT
A 5/5
A 2/5
A 1/5
A 4/5
Q4002 DTA143EUA-TLB
Q4003 DTC123TKA-TLB
Q4004 DTC123TKA-TLB
Q4005 dummy
Q4006 dummy
IC4002 RC4558D-TBB
D4007 PDZ12B-TRB
D4008 PDZ12B-TRB
CN4000 XKN1001
CN4001 XKN1001
CK4002
CK4004
CK4006
TV_Y0
TV_C0
TV_G0
TV_B0
TV_L0
TV_R0
VCR_Y0
VCR_C0
VCR_G1
VCR_B1
VCR_L0
VCR_R0
A_L2
A_R2
[Tuner]
RFMOD_AUDIO
570mVpp
[DEMUX]
SPDIF
OFF_D+5V
S/PDIF
optical
JA4000
PJ1001

3.7 MAIN ASSY (5/5)



A 5/5 MAIN ASSY (XWE1011)

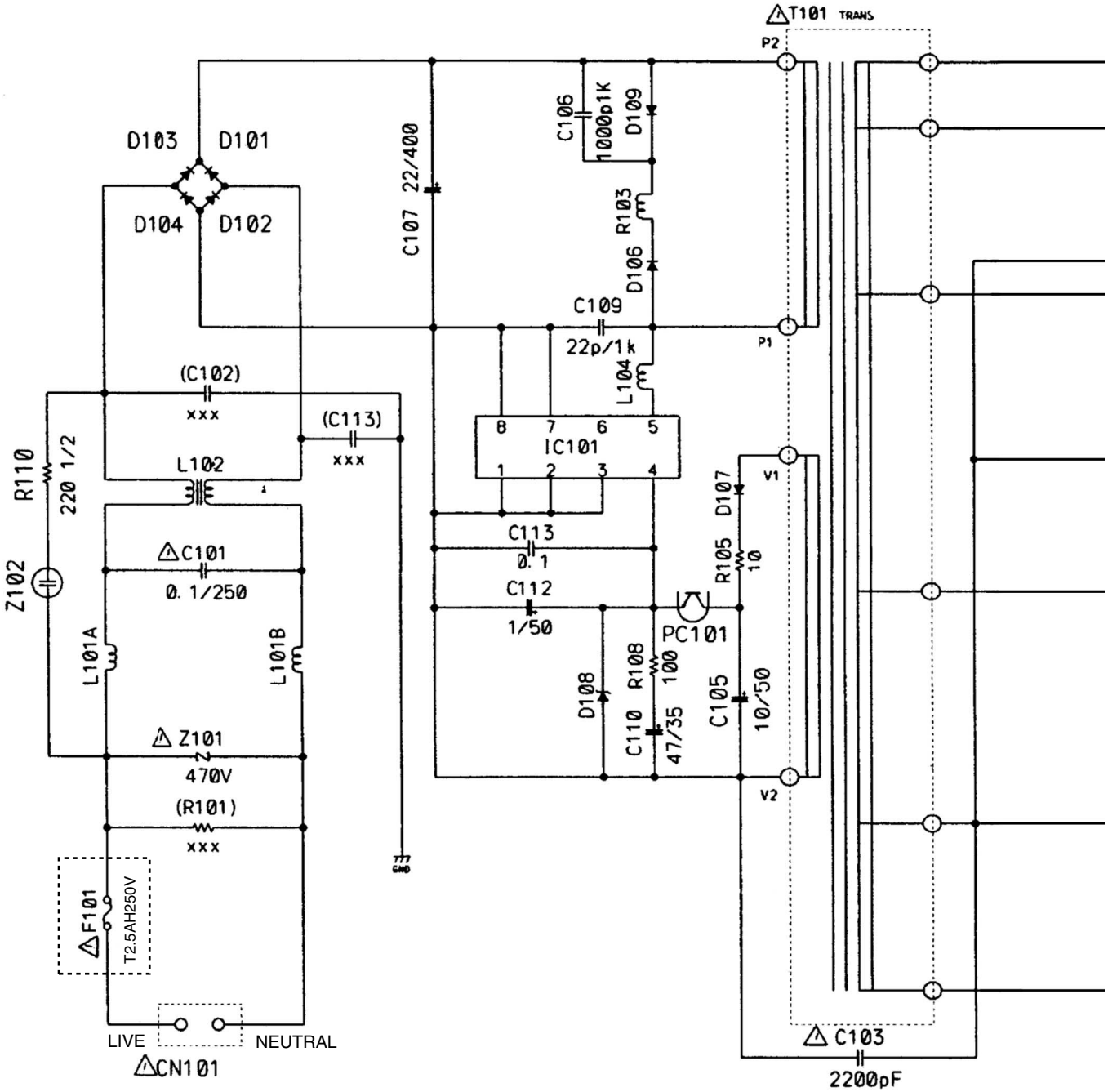




3.8 POWER ASSY

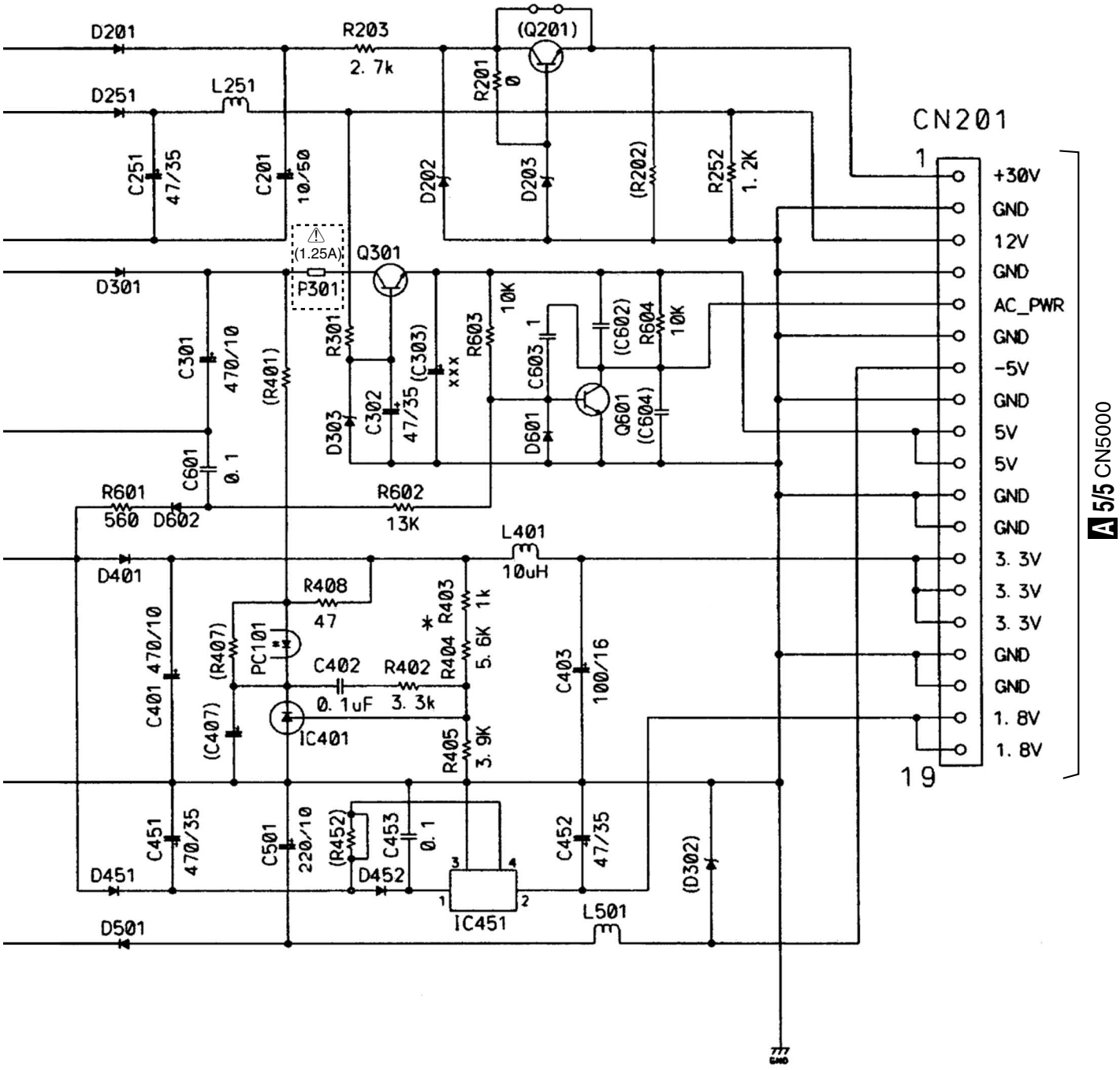
A

B POWER ASSY (XXF1004)



B

Note : No individual parts replacement for repair except F101 and P301 is accepted by Model Supplier due to the safety reasons.



• NOTE FOR FUSE REPLACEMENT

CAUTION - FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE AND RATINGS ONLY.

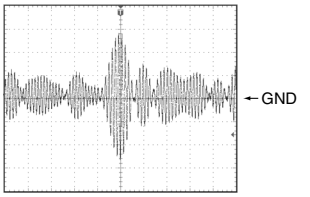
3.9 WAVEFORMS

A MAIN ASSY(1/2)

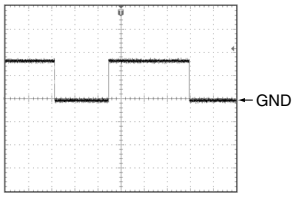
Note : The encircled numbers denote measuring point in the schematic diagram.

Measurement condition ;
Any Off-Air signal can be used.
Audio and Video waveform shown below results from using Colour Bar Video signal and 1kHz L, R Audio signal.

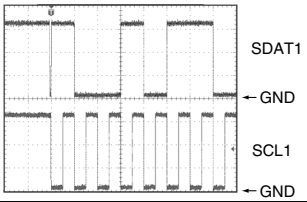
1 **M1000 - pin 10,11 (IF_OP2,OP1)**
V: 200mV/div. H: 1200nsec/div.



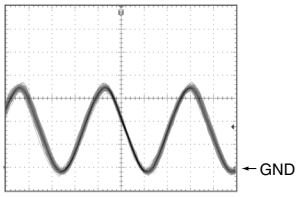
6 **TS1_9 - (AVVALID)**
V: 2.0V/div. H: 2.0µsec/div.



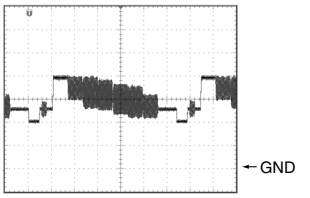
11 **12** **CN2001,CK2002- (SCL1, SDAT1)**
V: 1.0V/div. H: 100µsec/div.



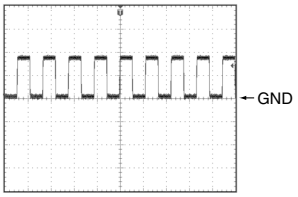
17 **Clock for IC3000 - (VSD_CLK)**
V: 1.0V/div. H: 2.0nsec/div.



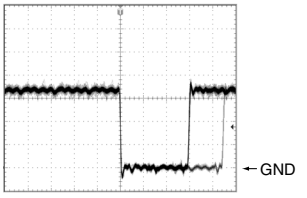
2 **CK1000 - (V_RF3)**
V: 500mV/div. H: 10µsec/div.



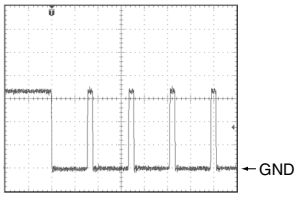
7 **TS1_8 - (AVCLK)**
V: 2.0V/div. H: 100nsec/div.



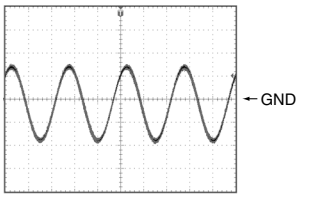
13 **RAS for IC3000 - (VSD_RAS)**
V: 1.0V/div. H: 20.0nsec/div.



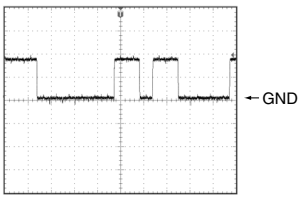
18 **CE for IC3002 - (F_CE)**
V: 1.0V/div. H: 100nsec/div.



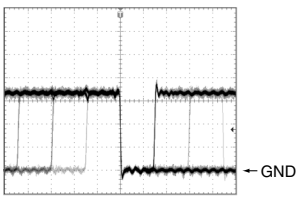
3 **CK1001 - (A_RF3)**
V: 200mV/div. H: 400µsec/div.



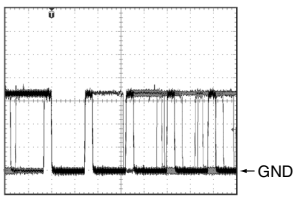
8 **TS1_0-TS1_7- (AVDAT0-7))**
V: 2.0V/div. H: 200nsec/div.



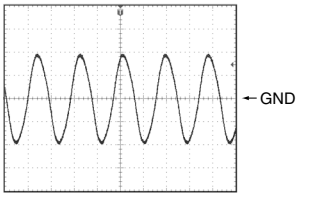
14 **CAS for IC3000 - (VSD_CAS)**
V: 1.0V/div. H: 20.0nsec/div.



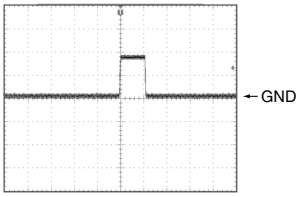
19 **OE for IC3002 - (F_OE)**
V: 1.0V/div. H: 100nsec/div.



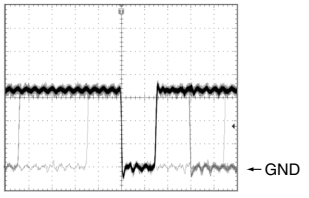
4 **CK1002 - (XTAL)**
V: 500mV/div. H: 20.0nsec/div.



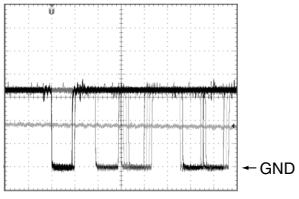
9 **TS1_10 - (AVFSTART)**
V: 2.0V/div. H: 100nsec/div.



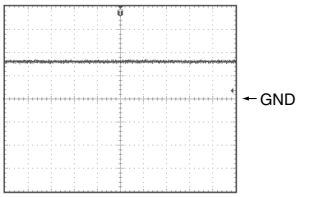
15 **WE for IC3000 - (VSD_WE)**
V: 1.0V/div. H: 20.0nsec/div.



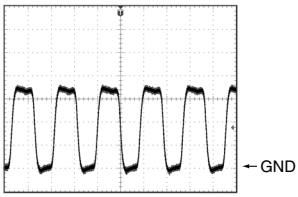
20 **WE for IC3002 - (F_WE)**
V: 1.0V/div. H: 100nsec/div.



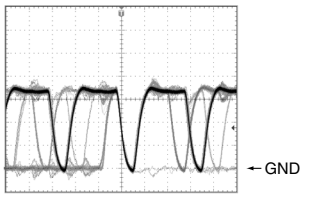
5 **CK1003 - (LOCK)**
V: 2.0V/div. H: 20.0nsec/div.



10 **IC2001-pin 10 (27M)**
V: 1.0V/div. H: 20.0nsec/div.



16 **CS for IC3000 - (VSD_CS)**
V: 1.0V/div. H: 10.0nsec/div.



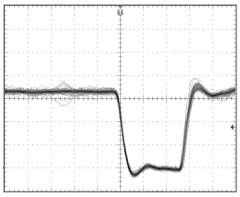
A MAIN ASSY(2/2)

Measurement condition ;

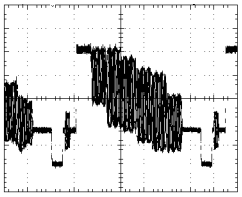
Any Off-Air signal can be used.

Audio and Video waveform shown below results from using Colour Bar Video signal and 1kHz L, R Audio signal.

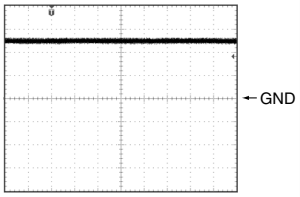
21 **RAS for IC3003 - (SD_RAS)**
V: 1.0V/div. H: 4.0nsec/div.



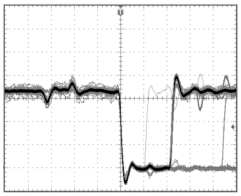
26 **CK4001 - (V2)**
V: 200mV/div. H: 10µsec/div.



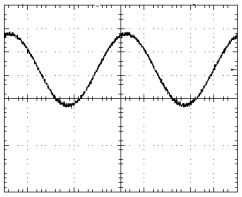
31 **CK5002 - (XSTBY)**
V: 1.0V/div. H: 400µsec/div.



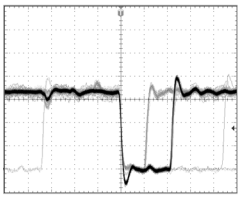
22 **CAS for IC3003 - (SD_CAS)**
V: 1.0V/div. H: 10.0nsec/div.



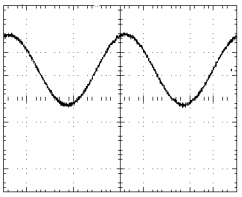
27 **CK4003 - A_L1)**
V: 1.0V/div. H: 200µsec/div.



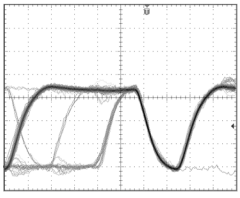
23 **WE for IC3003 - (SD_WE)**
V: 1.0V/div. H: 10.0nsec/div.



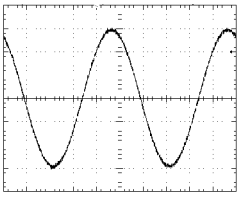
28 **CK4005 - (A_R1)**
V: 1.0V/div. H: 200µsec/div.



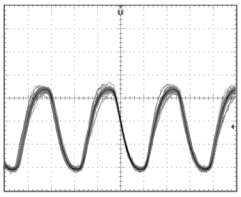
24 **CS for IC3003 - (SD_CS)**
V: 1.0V/div. H: 4.0nsec/div.



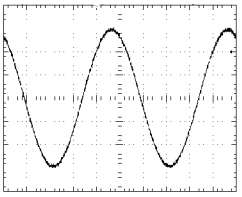
29 **CK4004 - (A_L2)**
V: 1.0V/div. H: 200µsec/div.



25 **Clock for IC3003 - SD_CLK)**
V: 1.0V/div. H: 4.0nsec/div.



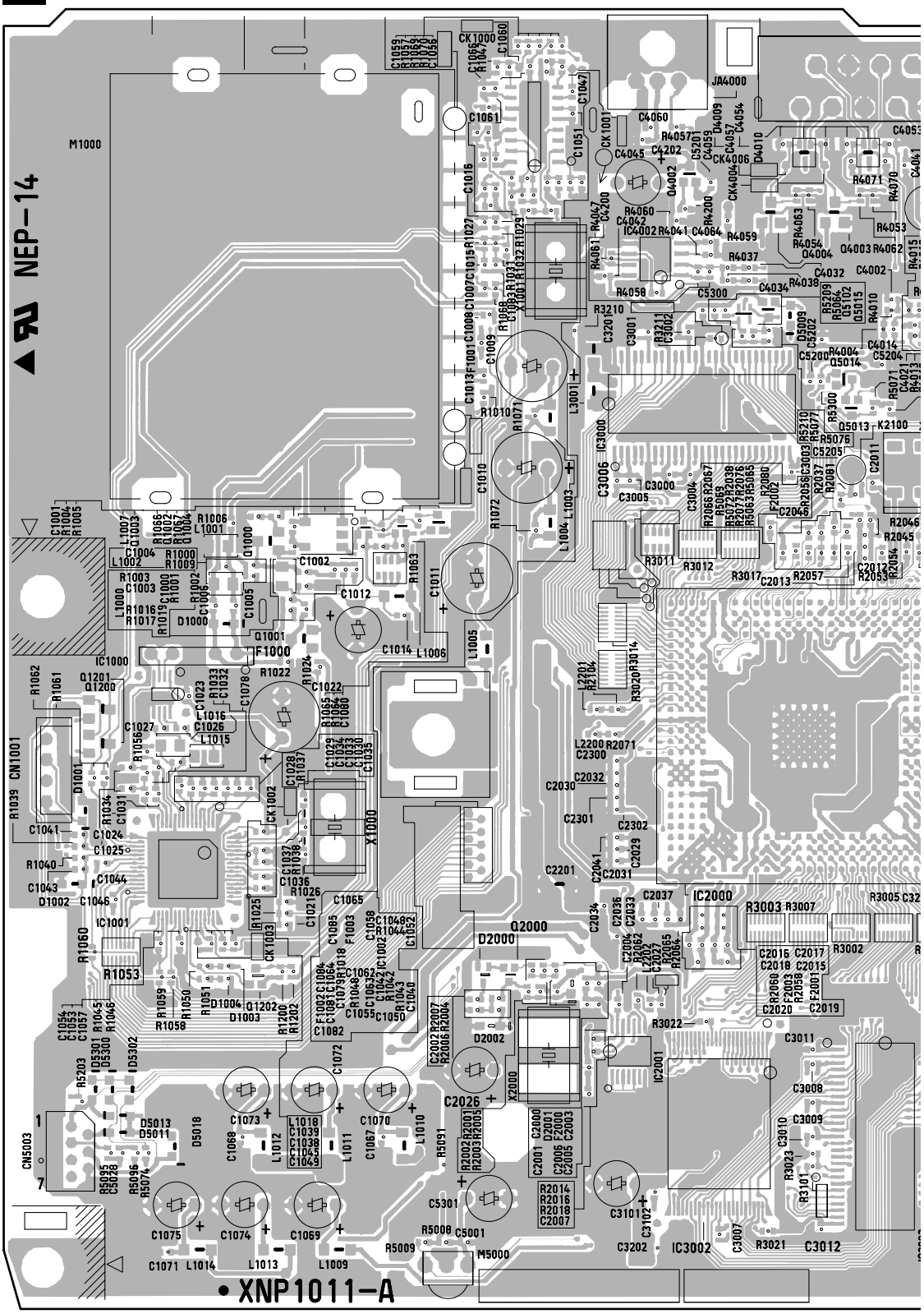
30 **CK4006 - (A_R2)**
V: 1.0V/div. H: 200µsec/div.



4. PCB CONNECTION DIAGRAM
4.1 MAIN ASSY

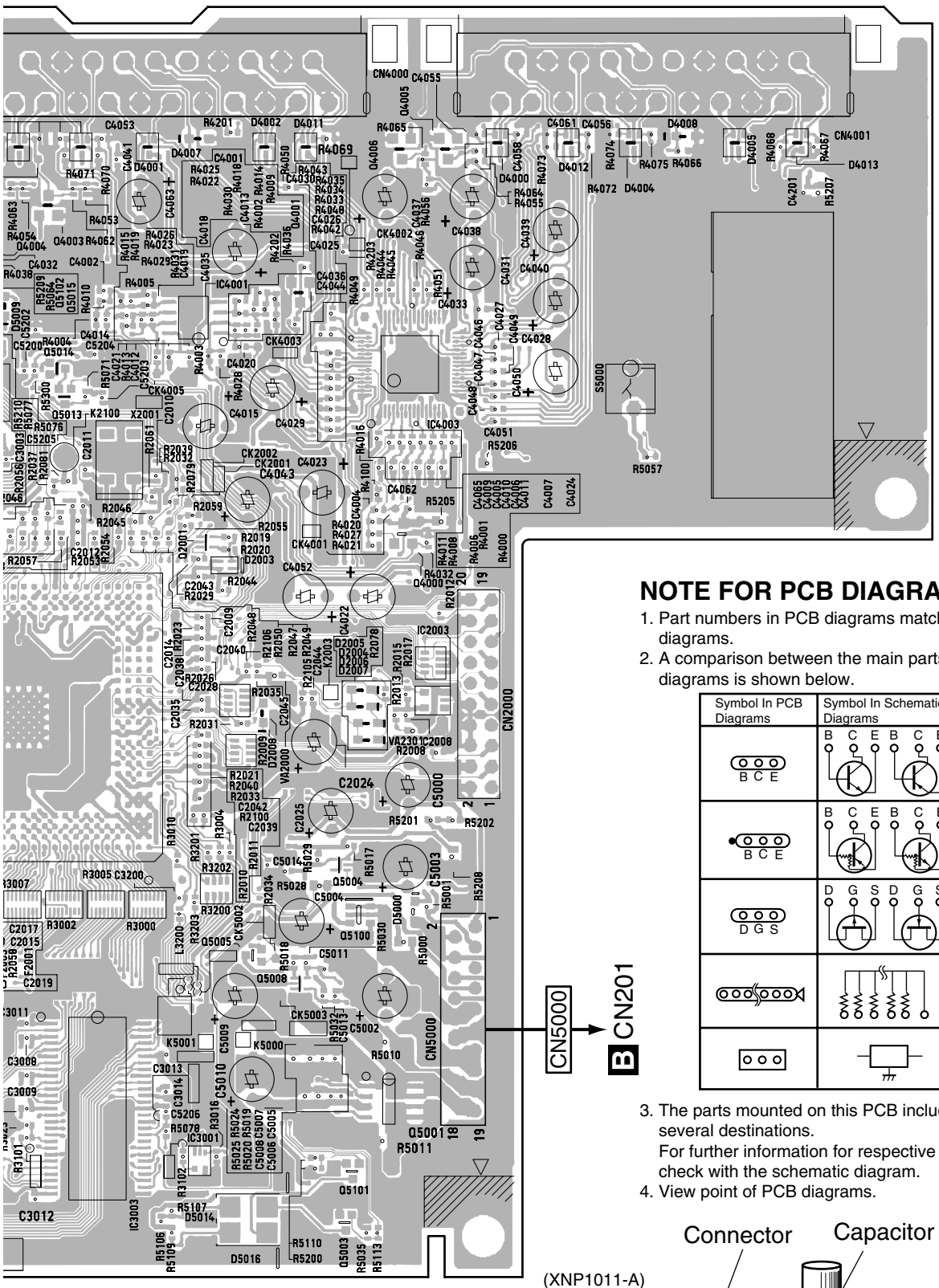
SIDE A

A MAIN ASSY



A

SIDE A

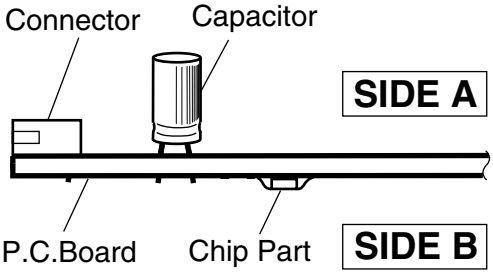


NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

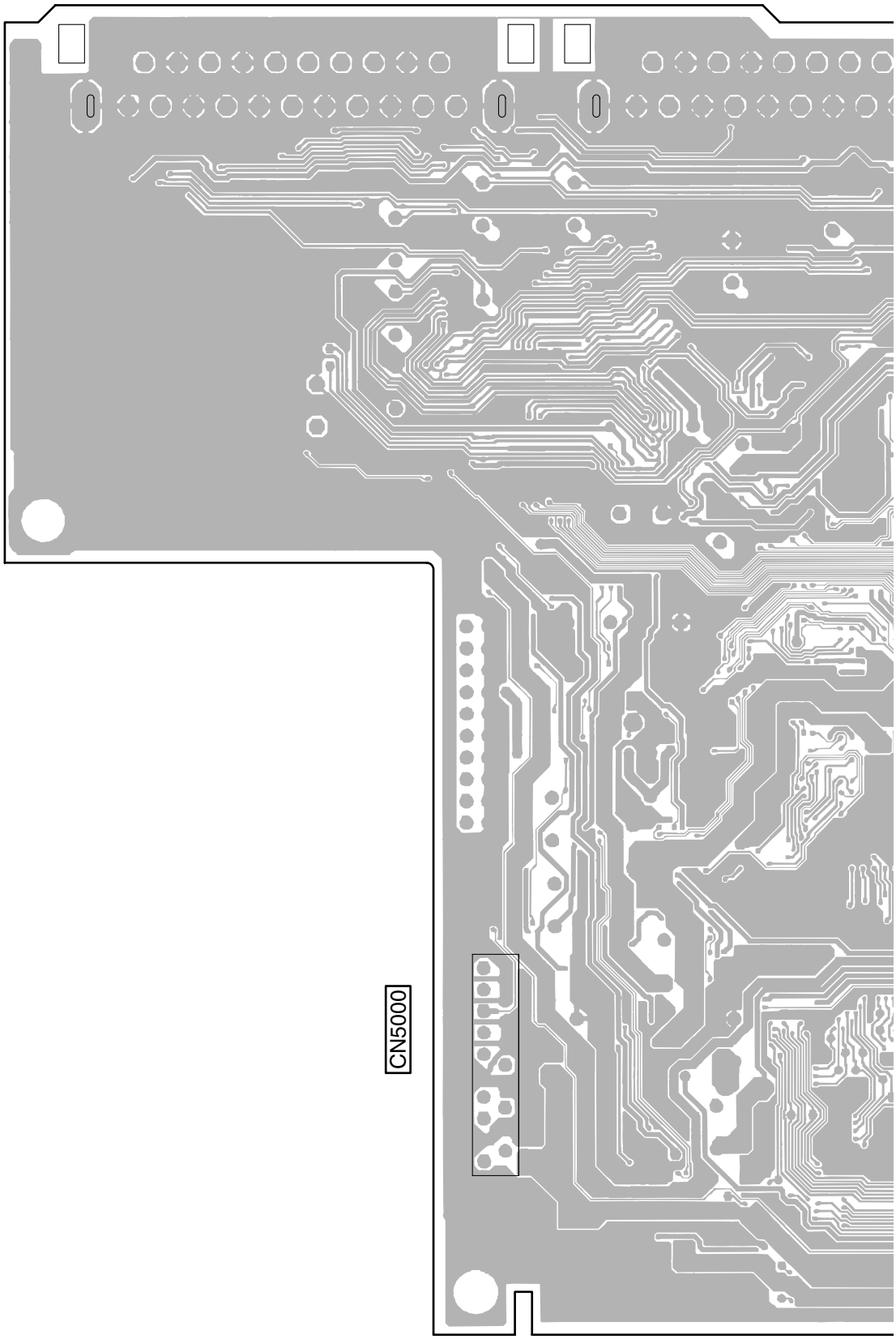
3. The parts mounted on this PCB include all necessary parts for several destinations.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



A

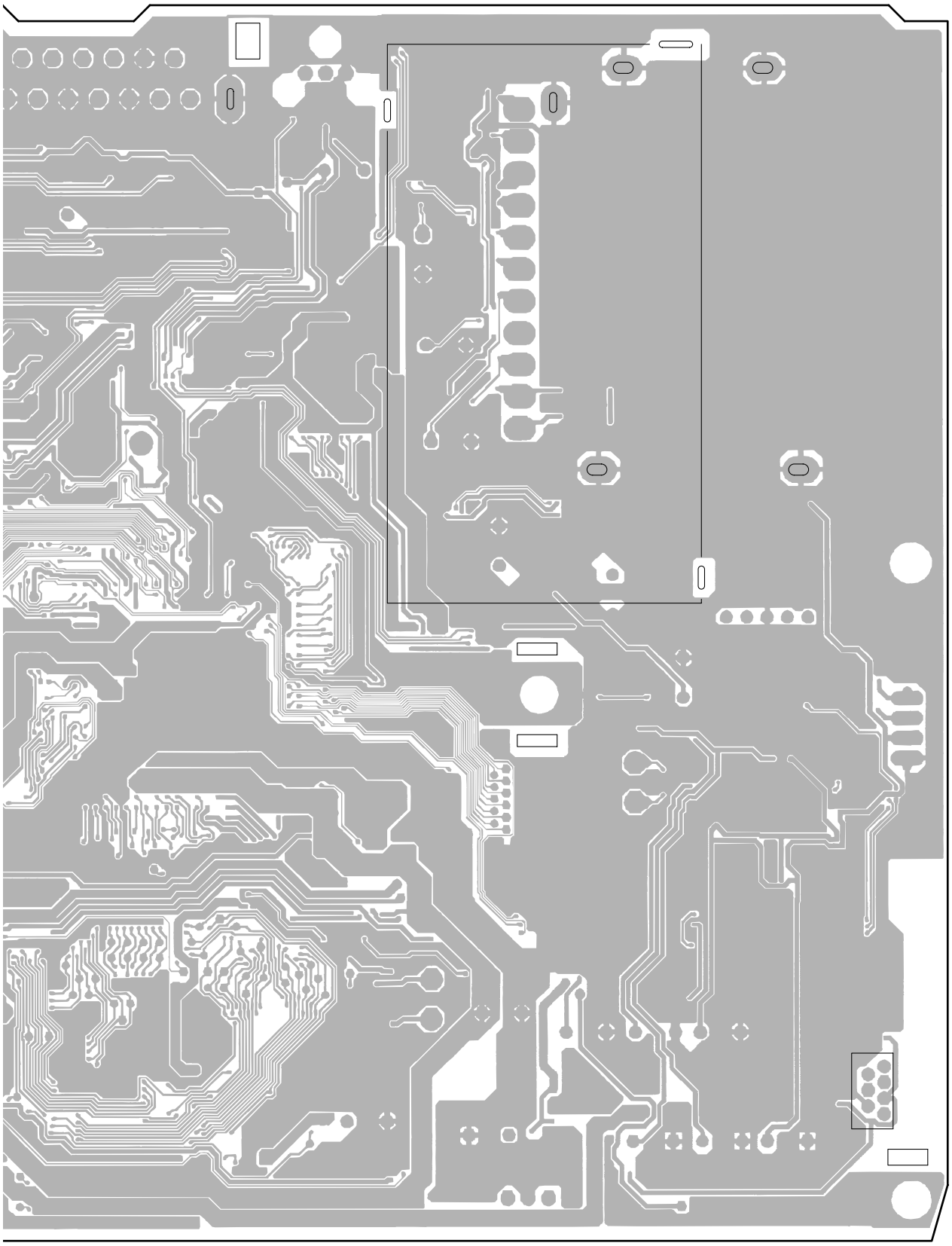
SIDE B

A MAIN ASSY



A

SIDE B



(XNP1011-A)

5. PCB PARTS LIST

NOTES: ● *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
● *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
● *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω	→ *56 x 10[1]* →	*561*	····· *RD1/4PU 5 6 1 J*
47k Ω	→ *47 x 10[3]* →	*473*	····· *RD1/4PU 4 7 3 J*
0.5 Ω	→ *R50*		····· *RN2H R 5 0 K*
1 Ω	→ *1R0*		····· *RS1P 1 R 0 K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω	→ *562 x 10[1]* →	*5621*	····· *RN1/4PC 5 6 2 1 F*

LIST OF ASSEMBLIES

Mark	No.	Description	Part No.
	1	MAIN ASSY	XWE1011
⚠	1	POWER ASSY	XXF1004

A 1/5 MAIN ASSY (1/5)_Tuner Block

SEMICONDUCTORS

Mark	No.	Description	Part No.
	IC1002		MC44BS373CAD
	IC1001		STV0360
	IC1000		UPC3221GV
	Q1002		2SA1576A
	Q1003		2SA1577
	Q1001		2SC2412K
	Q1004,Q1202		DTC124EUA
	Q1200,Q1201		RK7002
	D1000		1SS355

COILS AND FILTERS

Mark	No.	Description	Part No.
	L1001		LCYAR82J2520
	F1001-F1003	FERRITE CORE	VTF1091
	F1000	SAW FILTER	XTF1002
	L1003-L1006,L1009-L1014	CHIP FERRITE BEADS	XTX1001
	L1018	CHIP FERRITE BEADS	XTX1003
	L1007	CHIP BALUN TRANS.	XTX1005

CAPACITORS

Mark	No.	Description	Part No.
	C1036,C1037		CCSRCH100D50
	C1015,C1016,C1040,C1042,C1082		CCSRCH101J50
	C1084		CCSRCH101J50
	C1050		CCSRCH270J50
	C1051		CCSRCH471J50
	C1085		CCSRCH8R0D50
	C1069,C1070,C1072-C1075		CEHAT101M10
	C1011		CEHAT101M50
	C1009,C1010,C1022		CEHAT471M10
	C1061		CKSRYB102K50
	C1000,C1002,C1005,C1013		CKSRYB103K50
	C1033,C1034,C1038,C1060,C1062		CKSRYB103K50
	C1064,C1065		CKSRYB103K50
	C1007,C1008,C1014,C1021		CKSRYB104K16
	C1023-C1028,C1030-C1032,C1035		CKSRYB104K16
	C1039,C1044-C1047,C1049		CKSRYB104K16
	C1053,C1054,C1057,C1066,C1079		CKSRYB104K16
	C1083		CKSRYB104K16
	C1029		CKSRYB105K10
	C1048, C1063		CKSRYB223K25
	C1080,C1081		CKSRYF104Z16
	C1052		CKSRYF224Z16

RESISTORS

Mark	No.	Description	Part No.
	R1063		RAB4C150J
	R1900,R1901		RS1/10S0R0J
	R1053	CHIP RESISTOR ARRAY	XCN1001
	Other Resistors		RS1/16S###J

OTHERS

Mark	No.	Description	Part No.
	M1000	FRONT END	XXF1005
	X1000	CRYSTAL RESONATOR (27MHz)	XSS1004
	X1001	CRYSTAL RESONATOR (4MHz)	XSS1005

A 2/5 MAIN ASSY (2/5)_DMUX Block

SEMICONDUCTORS

Mark	No.	Description	Part No.
	IC2003		BD4720G
	IC2001		SN74LVU04APW
	IC2000		STI5517AWA
	Q2000		2SC4081
	D2000		DA204U
	D2002		HVU307
	D2001		PDZ8.2B
	D2005,D2007		RB501V-40
	VA2000,VA2301		AVR-M1608C120MT2AB

COILS AND FILTERS

Mark	No.	Description	Part No.
	F2000-F2003	FERRITE CORE	VTF1091
	L2201,L2202	CHIP FERRITE BEADS	XTX1002
	L2200	CHIP FERRITE BEADS	XTX1003

CAPACITORS

Mark	No.	Description	Part No.
	C2010,C2011		CCSRCH100D50
	C2300,C2302		CCSRCH101J50
	C2007,C2044,C2045		CCSRCH390J50
	C2004		CCSRCH471J50
	C2026		CEHAT101M10
	C2024,C2025		CEHAT101M16
	C2006,C2012,C2015,C2016		CKSRYB102K50
	C2009		CKSRYB105K10
	C2000		CKSRYB471K50
	C2001,C2003,C2005,C2008		CKSRYF104Z16
	C2013,C2014,C2017-C2020		CKSRYF104Z16
	C2028-C2031,C2033-C2035		CKSRYF104Z16
	C2037-C2039,C2041-C2043		CKSRYF104Z16

Mark	No.	Description	Part No.
	C2046		CKSRYF105Z10
	C2032,C2036,C2040,C2301		CKSRYF223Z50
	C2002		CKSRYF474Z16

RESISTORS

	R2009,R2017,R2035	RAB4C103J
	Other Resistors	RS1/16S###J

OTHERS

X2001	CRYSTAL RESONATOR (32.769kHz)	BSS1091
X2000	CRYSTAL RESONATOR (27MHz)	BSS1112

A 3/5 MAIN ASSY (3/5)_Memory Block

SEMICONDUCTORS

	IC3002	XYW1003
	IC3000,IC3003	K4S641632F-TC70
	IC3001	TC7SZ126FU

COILS AND FILTERS

L3001	CHIP FERRITE BEADS	XTX1001
L3200	CHIP BEADS FILTER	XTX1004

CAPACITORS

	C3101	CEHAT101M10
	C3002-C3004,C3007,C3010-C3012	CKSRYF104Z16
	C3102	CKSRYF104Z16
	C3000,C3001,C3005,C3006	CKSRYF223Z50
	C3008,C3009,C3013,C3014	CKSRYF223Z50

RESISTORS

	R3000,R3002,R3003,R3005,R3007	BCN1067
	R3012,R3014,R3017,R3020	BCN1067
	R3200	RAB4C101J
	R3011	RAB4C470J
	Other Resistors	RS1/16S###J

A 4/5 MAIN ASSY (4/5)_AV Block

SEMICONDUCTORS

	IC4001,IC4002	RC4558D
	IC4003	STV6413D
	Q4000	2SC2412K
	Q4002	DTA143EUA
	Q4003,Q4004	DTC123TKA
	Q4001	RK7002
	D4007,D4008	PDZ12B
	D4000-D4002,D4004,D4005	UMZ12N
	D4009-D4013	UMZ12N

CAPACITORS

	C4042,C4201,C4202	CCSRCH101J50
	C4022,C4023,C4028,C4029,C4031	CEHAT100M50
	C4037-C4040,C4052,C4063	CEHAT100M50
	C4043	CEHAT101M16
	C4045	CEHAT1R0M50
	C4015,C4035	CEHAT221M10
	C4053-C4059,C4061,C4200	CKSRYB102K50
	C4012	CKSRYB103K50
	C4005-C4007,C4009-C4011,C4026	CKSRYB104K16
	C4036,C4044,C4047,C4051	CKSRYB104K16
	C4020,C4021,C4032,C4034,C4046	CKSRYB105K10
	C4048-C4050	CKSRYB105K10
	C4001,C4002,C4018,C4019	CKSRYB332K50
	C4024,C4025,C4027,C4030,C4033	CKSRYF104Z16
	C4041,C4060,C4062,C4064,C4065	CKSRYF104Z16

RESISTORS

	R4000,R4001,R4006,R4008,R4011	RS1/16S2000F
	R4016	RS1/16S2000F
	Other Resistors	RS1/16S###J

OTHERS

JA4000	OPT. LINK OUT	JFJ1001
CN4000,CN4001	SCART CONNECTOR	XKN1001
63	GROUND PLATE	BBK1004

A 5/5 MAIN ASSY (5/5)_Control Block

SEMICONDUCTORS

	Q5015	DTA124EUA
	Q5005,Q5013,Q5014	DTC124EUA
	Q5003,Q5101	DTC143EUA
	Q5100	TPC6004
	Q5001	TPC8201
	Q5004,Q5008	UMG1N
	D5009,D5011,D5013,D5018	RB501V-40
	D5300-D5302	RB501V-40
	D5016	TLGE1005B
	D5014	TLRE1005B
	D5000	UDZS3R6

CAPACITORS

	C5200-C5204,C5300	CCSRCH101J50
	C5000	CEHAT100M50
	C5009,C5010	CEHAT101M10
	C5002,C5004	CEHAT101M16
	C5003	CEHAT101M25
	C5005,C5006,C5013,C5028	CKSRYF104Z16
	C5001	CKSRYF105Z10
	C5205,C5206	CKSRYF223Z50
	C5011,C5014	CKSRYF474Z16

RESISTORS

	R5019,R5020,R5024,R5025	RS1/10S471J
	Other Resistors	RS1/16S###J

OTHERS

M5000	REMOTE SENSOR UNIT	RPM7140
CN5000	19P PLUG	BKP1120
CN5003	7P CONNECTOR	VKN1211

B POWER ASSY

SEMICONDUCTORS

⚠	P301	CHIP FUSE(1.25A)	ERBFE1R25

There are no service parts available except F101 and P301.
Refer to “2.2 EXTERIOR SECTION” for the spec of F101.

6. ADJUSTMENT

There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 CHECK MODE

1. Inspection Software Mode

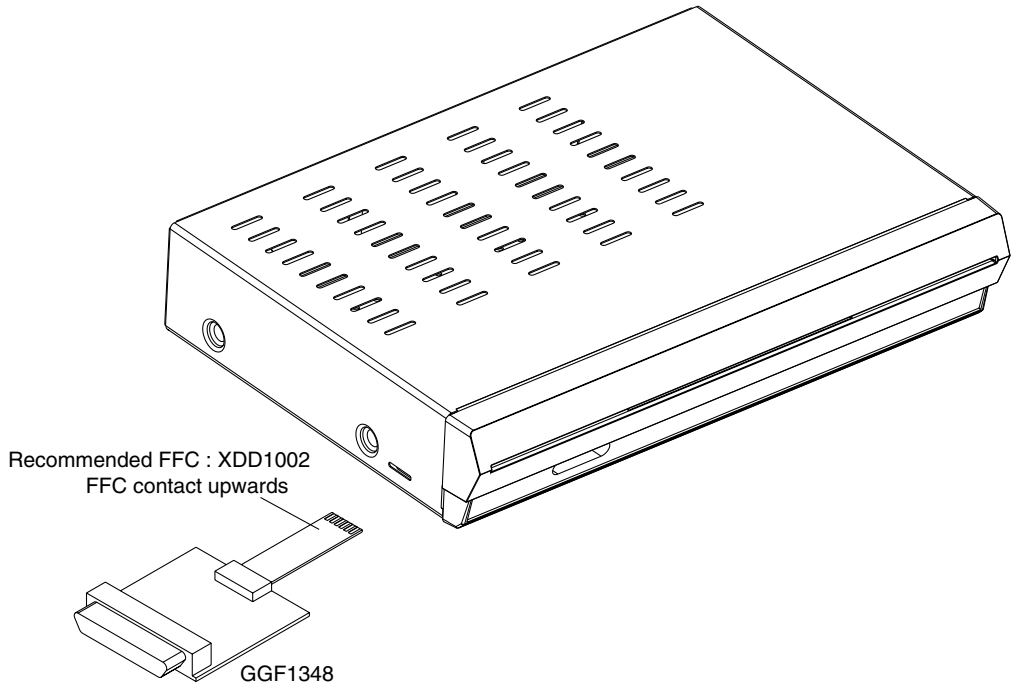
The DBR-TF100 test software is resident in the flash.

● How to enter Inspection Software Mode:

1. Connect the serial debug PCB (GGF1348) to the IRD (see diagram below).
2. Switch on the IRD.
3. Connect the PC serial lead to the serial debug PCB.

NOTE:
If step 3 is carried out before step 2 then the Inspection Software Mode will not be started and the normal application will run.

Remark : The IRD can be put in Inspection Software mode by shorting Pin 4 of CN5003 to 5V.



During initialisation, if any step fails LED flashes indicate which step fails.
The number of flashes is as shown in the table below.

Red ON	Inspection Software started	MAIN CPU running
Green 2	Fail Serial Port	
Green 3	Fail AV Switch (IC4003)	I2C Register Write
Green 4	Fail Modulator IC (IC1002)	I2C Register Write
Green 5	Fail Tuner (IC1001/M1000)	I2C Register Write
Red and Green ON	Initialisation complete	Inspection software waiting for command

● How to exit Inspection Software Mode:

1. Switch off the power.
2. Disconnect the serial debug PCB.
3. Switch the power on again.

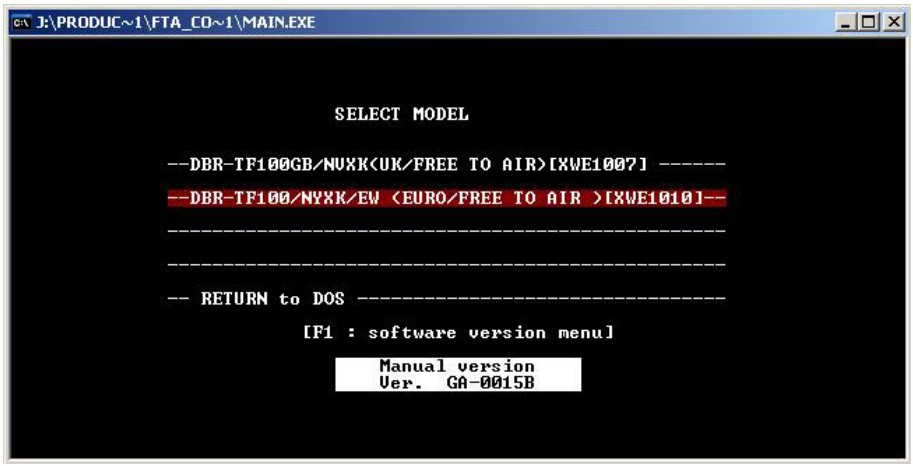
2. Starting and Operating the Communication Check Software GA-0015B

PC Operation Environment

DOS/V machine OS: MS-DOS
Execution Program: GA0015B.exe (Order Code PEE1034)

Selecting the required model

When GA0015B.exe is started the following screen initial screen is displayed.

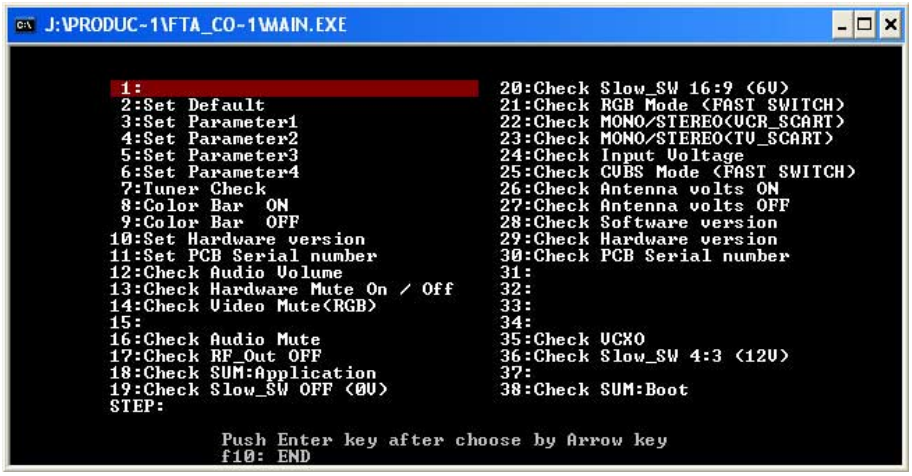


Press the Return Key to select DBR-TF100. The following screen will be displayed.

Selecting checks to be made

The inspection software allows a number of operation checks of the IRD to be made. The checks carried out can be specified in the " make step_file " and can be changed using the following process.
Using the up and down arrow keys select the MAKE CHECK_STEP option from the MAIN MENU and press the Return key. The following screen will be displayed.

Press " y " to overwrite the existing " make step_file ". The following menu of options is displayed.



Use the cursor keys to move around the menu and press enter to add steps. When all required steps are added press f10 to return to the MAIN MENU screen.

The following table (overleaf) is a list of commands and their functions.

Note:

∗1. Functionality can only be checked using the check_step method

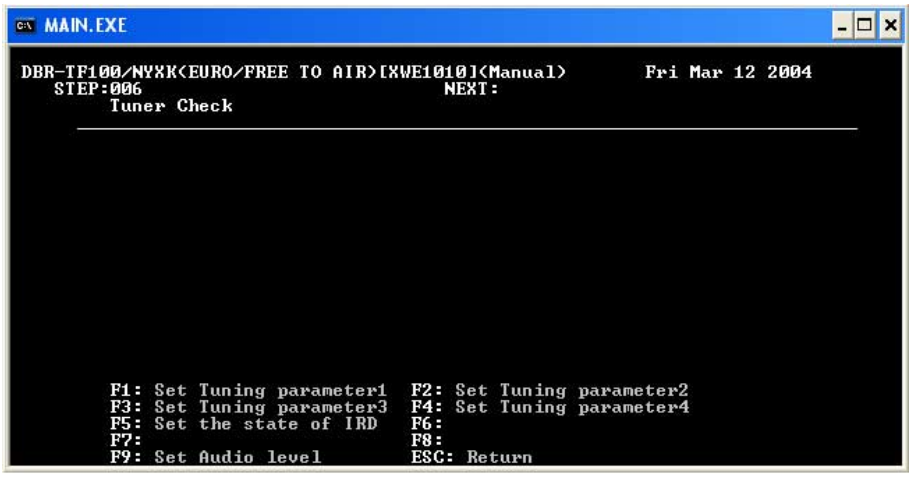
∗2. Functionality which can more easily be checked with the " IRD State " window (f5) or with the normal application.

∗3. Functionality only useful during production or design stages.

No.	Command	Function	Remarks
1	Reserved		
2	Set Default	Return the unit to factory settings	∗1
3	Set Parameter1	Transmits the command used for setting the parameters required for IRD tuning. (To set the parameters press f1 in the IRD CHECK screen)	∗1
4	Set Parameter2	As above (but set parameters by pressing f2)	∗1
5	Set Parameter3	As above (but set parameters by pressing f3)	∗1
6	Set Parameter4	As above (but set parameters by pressing f4)	∗1
7	Tuner Check	Check tuner BER is OK/not OK when receiving a low level signal.	∗1
8	Colour Bar ON	Turn on the small colour bar in the bottom left side of the screen (useful to check video output exists with no input signal – default state is ON)	∗1
9	Colour Bar OFF	Turn off the colour bar if it obstructs an area of the display to be checked.	∗1
10	Set Hardware Version	Set the hardware version of the PCB. Only if the flash replaced	∗1
11	Set PCB Serial Number	Set the PCB serial number. Only if the flash is replaced.	∗1
12	Check Audio Volume	Volume is set to minimum, then returns to normal after 1 second (This volume setting is controlled by the AV Switch IC)	∗1
13	Check hardware mute on/off	Mutes the TV scart output then returns to normal (Hardmute is used to prevent switch-on pop noise)	∗1
14	Check video mute RGB	Mutes the RGB signals on TV scart, then turns on again after 1 second	∗2
15	Reserved		
16	Check Audio Mute	Mutes the TV scart output then returns to normal (This mutes the audio using the Scart Switch IC)	∗1
17	Check RF_Out OFF	Check the RF modulator output is switched off	∗2
18	Check SUM:Application	Check that is used only in production	∗3
19	Check Slow_SW OFF (0V)	Set the slow switch level to 0V	∗2
20	Check Slow_SW 16:9 (6V)	Set the slow switch level to 6V	∗2
21	Check RGB Mode (FAST SWITCH)	Set the fast switch level to high level	∗1
22	Check MONO/STEREO(VCR SCART)	Change the audio to mono mode	∗2
23	Check MONO/STEREO(TV SCART)	Change the audio to mono mode	∗2
24	Check Input Voltage	Check the slow switch level on the VCR scart	∗1
25	Check CVBS Mode (FAST SWITCH)	Set the fast switch level to low level	∗1
26	Check Antenna Volts ON	Switch ON 5V supply for powered antenna	∗1
27	Check Antenna Volts OFF	Switch OFF 5V supply for powered antenna	∗1
28	Check Software Version	Check that is used only in production	∗3
29	Check Hardware Version	Check that is used only in production	∗3
30	Check PCB Serial Number	Check that is used only in production	∗3
31	Reserved		
32	Reserved		
33	Reserved		
34	Reserved		
35	Check VCXO	Change the VCXO frequency between max and min levels	∗1
36	Check Slow_SW 4:3 (12V)	Set the slow switch level to 12V	∗2
37	Reserved		
38	Check SUM:Boot	Check that is used only in production	∗3

Checking the IRD

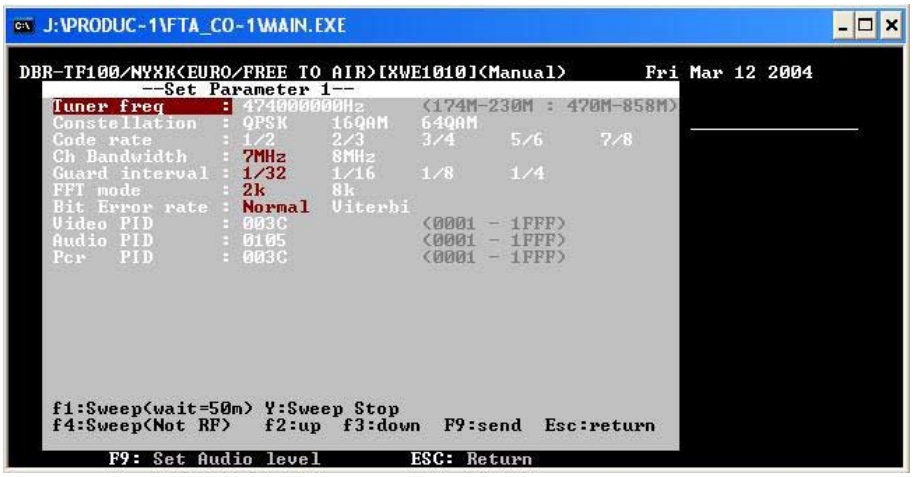
Select IRD_CHECK and press the Return key. The following screen is displayed.


MAIN.EXE
DBR-TF100/NYXK(EURO/FREE TO AIR)[XWE1010](Manual) Fri Mar 12 2004
STEP:006 NEXT:
Tuner Check
F1: Set Tuning parameter1 F2: Set Tuning parameter2
F3: Set Tuning parameter3 F4: Set Tuning parameter4
F5: Set the state of IRD F6:
F7: F8:
F9: Set Audio level ESC: Return

From this screen the IRD can be controlled by two methods.

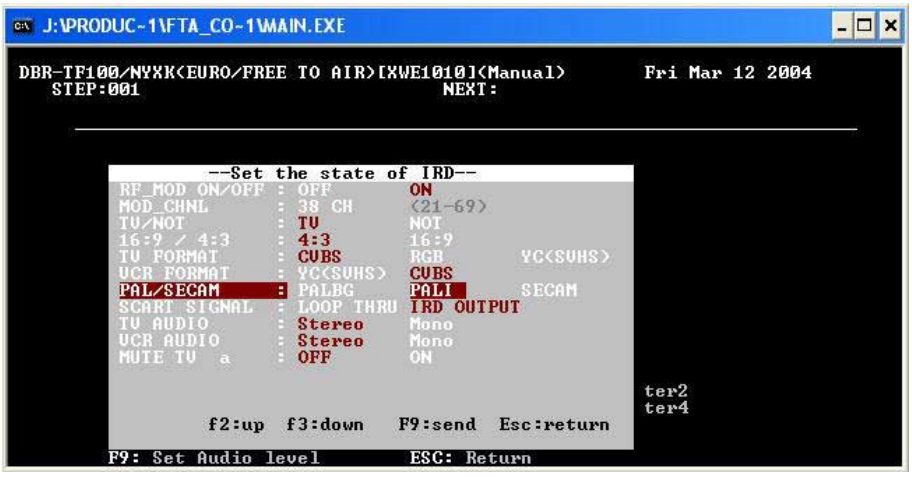
1. MAKE CHECK_STEP commands.
   The selected command is displayed at the top of the screen (i.e. STEP:006 Tuner Check above).
   Press the Return key to transmit the selected command to the IRD. If the IRD operates normally for the transmitted command, " OK " will be displayed. If a problem exists, " NG " will be displayed.
   It is possible to select which step will be transmitted using the up and down arrow keys.

2. Function Keys.
   (f1~f4) Set Tuning Parameter 1~4: Used to set the parameters of the received signal.
   After completion of settings, the data is transmitted to the IRD by pressing the " f9 " key.

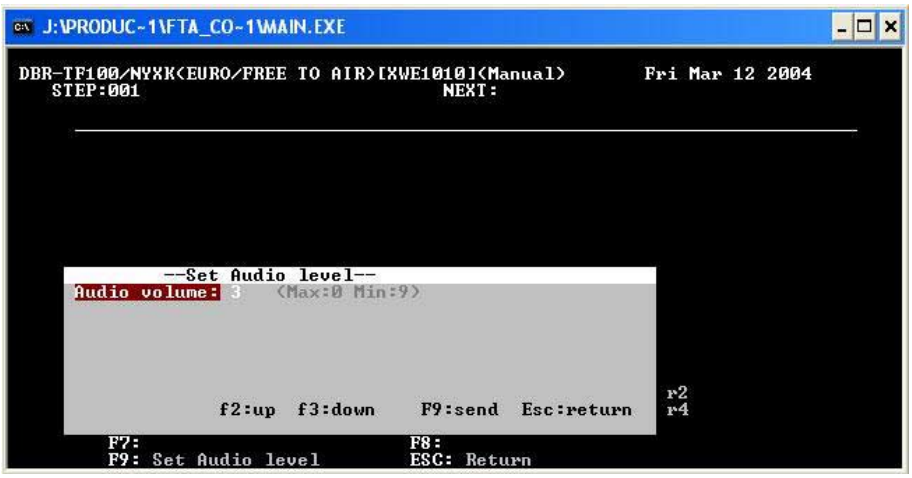

J:\PRODUC~1\FTA_CO~1\MAIN.EXE
DBR-TF100/NYXK(EURO/FREE TO AIR)[XWE1010](Manual) Fri Mar 12 2004
--Set Parameter 1--
Tuner freq : 474000000Hz (174M-230M : 470M-858M)
Constellation : QPSK 16QAM 64QAM
Code rate : 1/2 2/3 3/4 5/6 7/8
Ch Bandwidth : 7MHz 8MHz
Guard interval : 1/32 1/16 1/8 1/4
FFT mode : 2k 8k
Bit Error rate : Normal Viterbi
Video PID : 003C (0001 - 1FFF)
Audio PID : 0105 (0001 - 1FFF)
Pcr PID : 003C (0001 - 1FFF)
f1:Sweep(wait=50m) Y:Sweep Stop
f4:Sweep(Not RF) f2:up f3:down F9:send Esc:return
F9: Set Audio level ESC: Return

(f5) Set the state of the IRD: This is used to set slow switch level, etc.

After completion of settings, the data is transmitted to the IRD by pressing the " f9 " key.



(f9) Set the audio level: This is used to adjust the audio level. 0 is maximum level and 9 is minimum level. After completion of settings, the data is transmitted to the IRD by pressing the " f9 " key.



3. Starting and Operating the Download Software - download.exe

PC Operation Environment

Machine OS: Windows
Execution Program: download.exe (Order Code PEE1035)

Downloading Code To The IRD

Download.exe is a command line base utility. To use it follow the steps below.

1. Start a command prompt window.
2. Change to the directory containing the download.exe utility and the software to be downloaded.
3. Type a command in the form *download <command> <filename> -port <port>*

KEY: <command> -wbo to download boot code
-wrs to download resident software
<filename> filename and path including the file extension
<port> the com port to which the IRD is connected
(not required if the IRD is connected to com1)

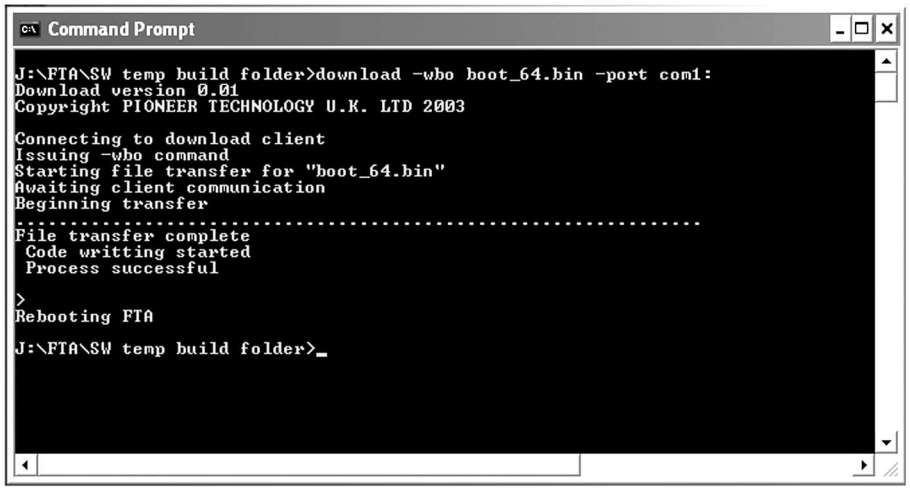
4. After each download process the IRD will restart (or reboot).
5. Be careful not do interrupt the power during the code writing process.

Interruption of the download process

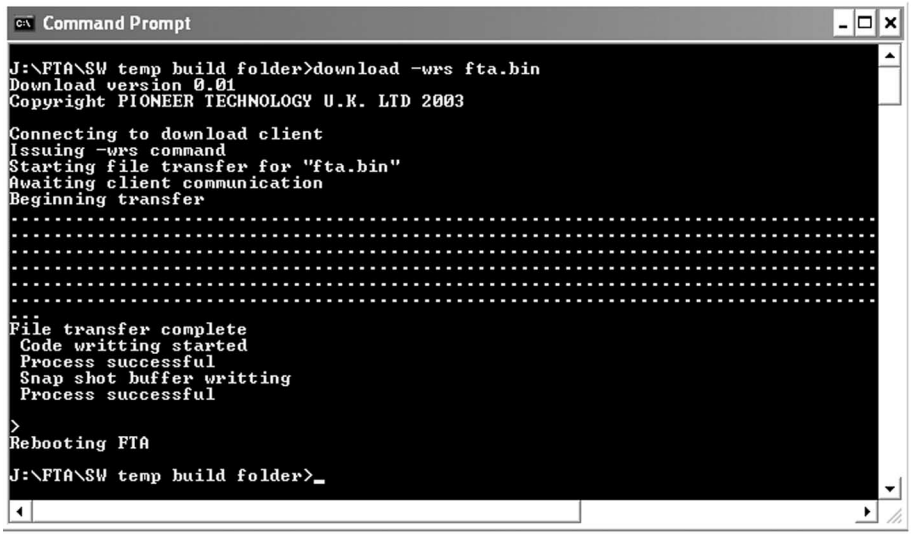
Be careful not to interrupt the code writing process of a boot code download. This will result in invalid boot code being stored in the flash and will prevent the unit booting. This is unlikely due to the short time this process takes (less than one second).
Interruption of resident software download should not cause a problem at any stage.

Examples of terminal display:

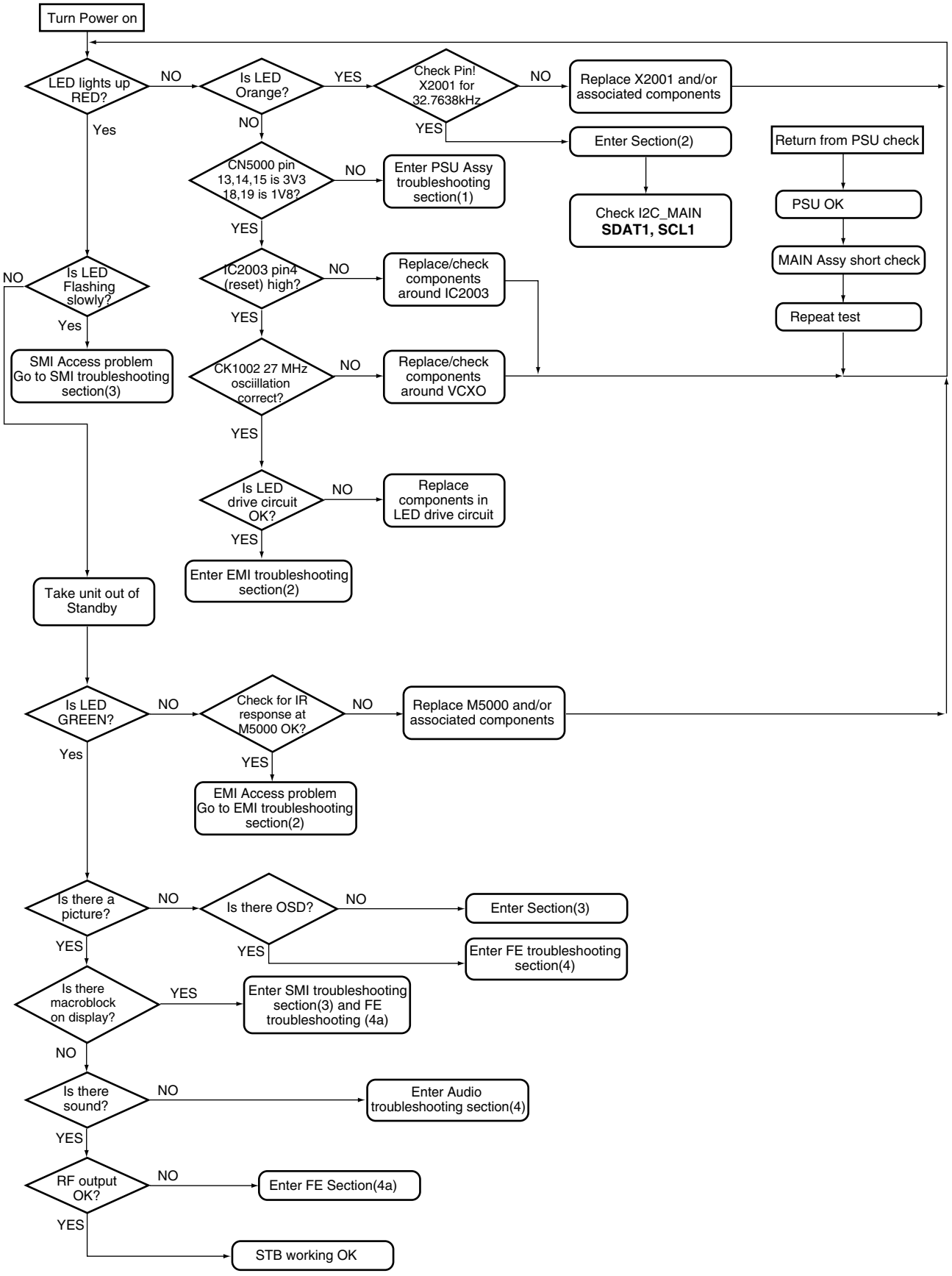
download –wbo boot_64.bin –port com2: download boot software contained in boot_64.bin via COM2



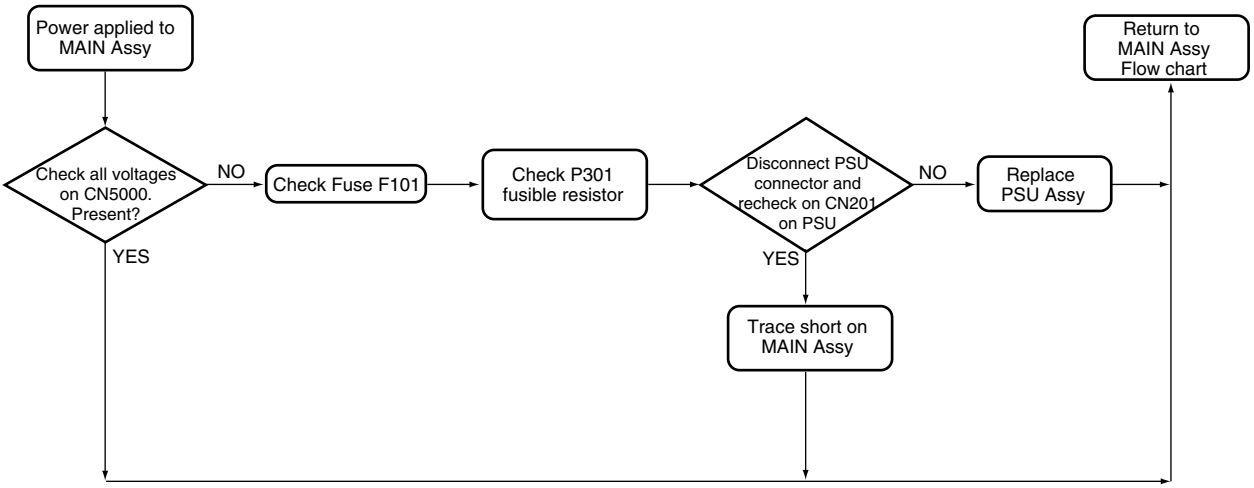
download- wrs fta.bin download resident software contained in fta. bin bia COM1



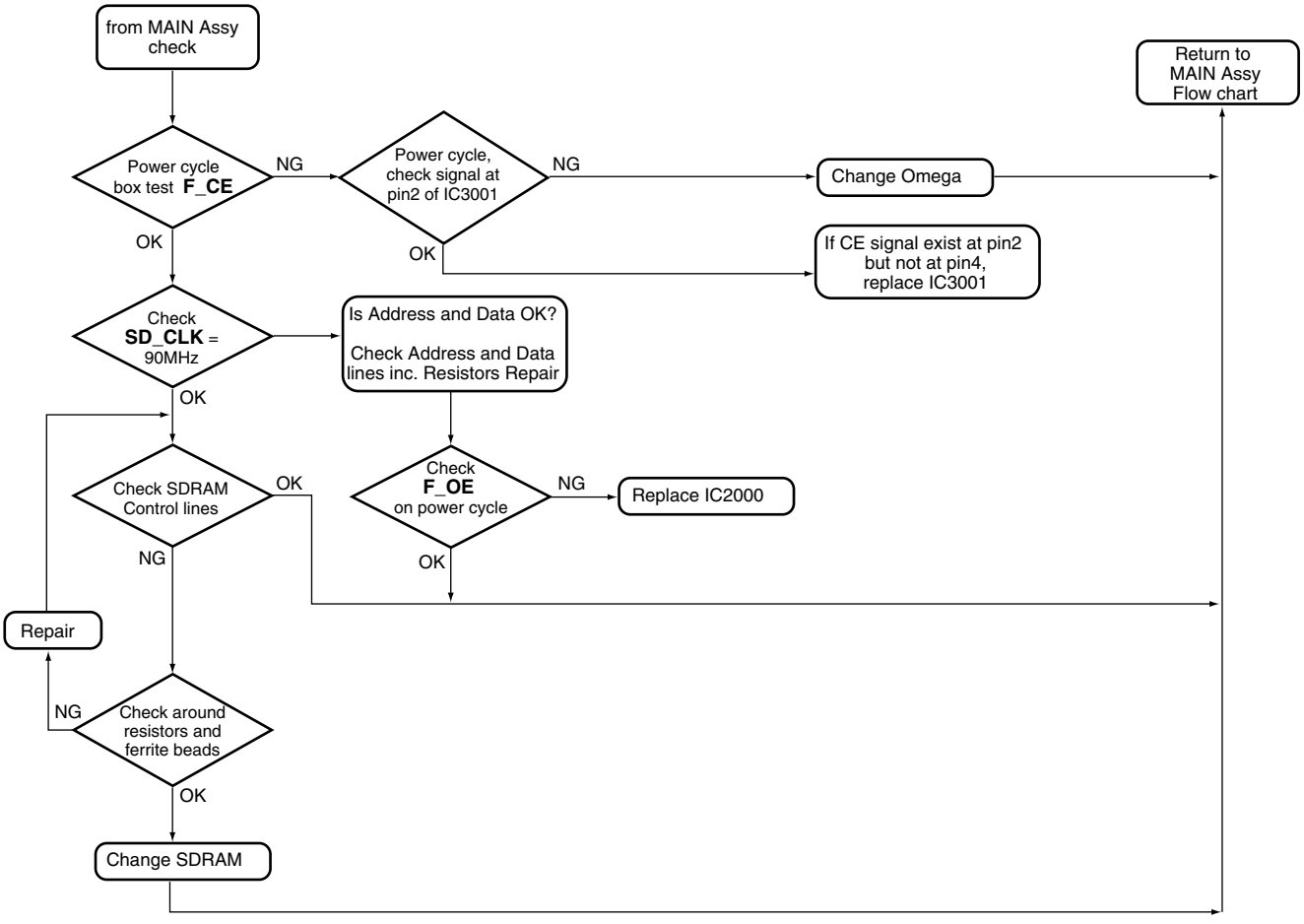
7.1.2 TROUBLE SHOOTING



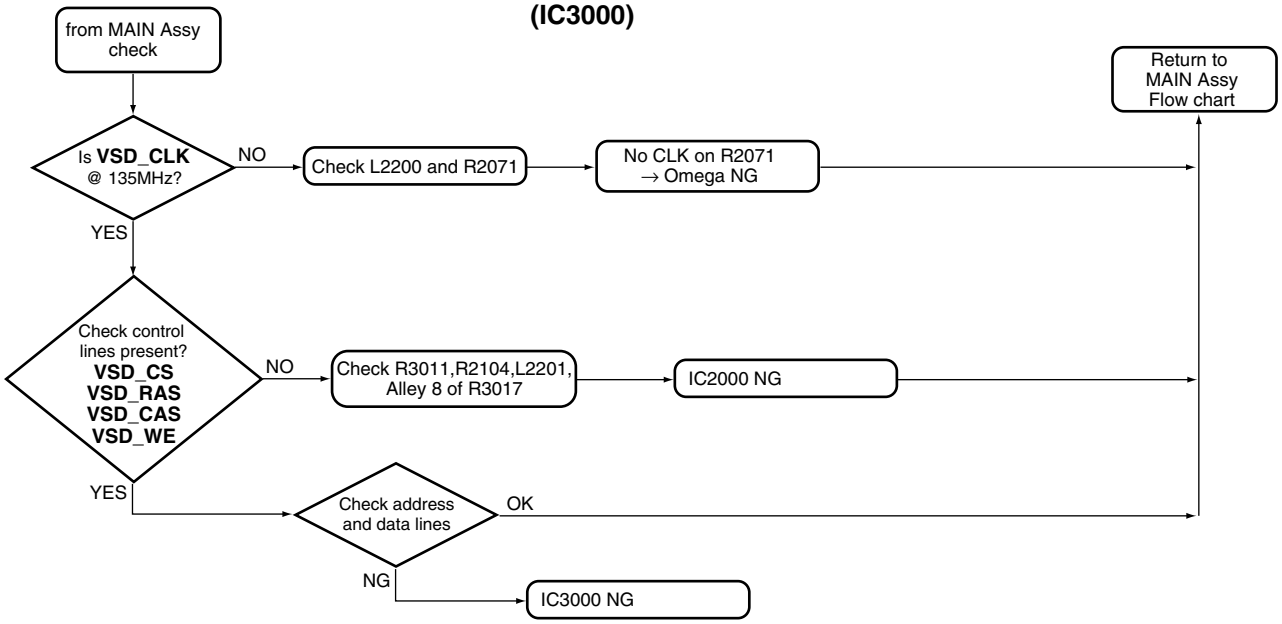
[PSU(Power) Assy Troubleshooting Section (1)]



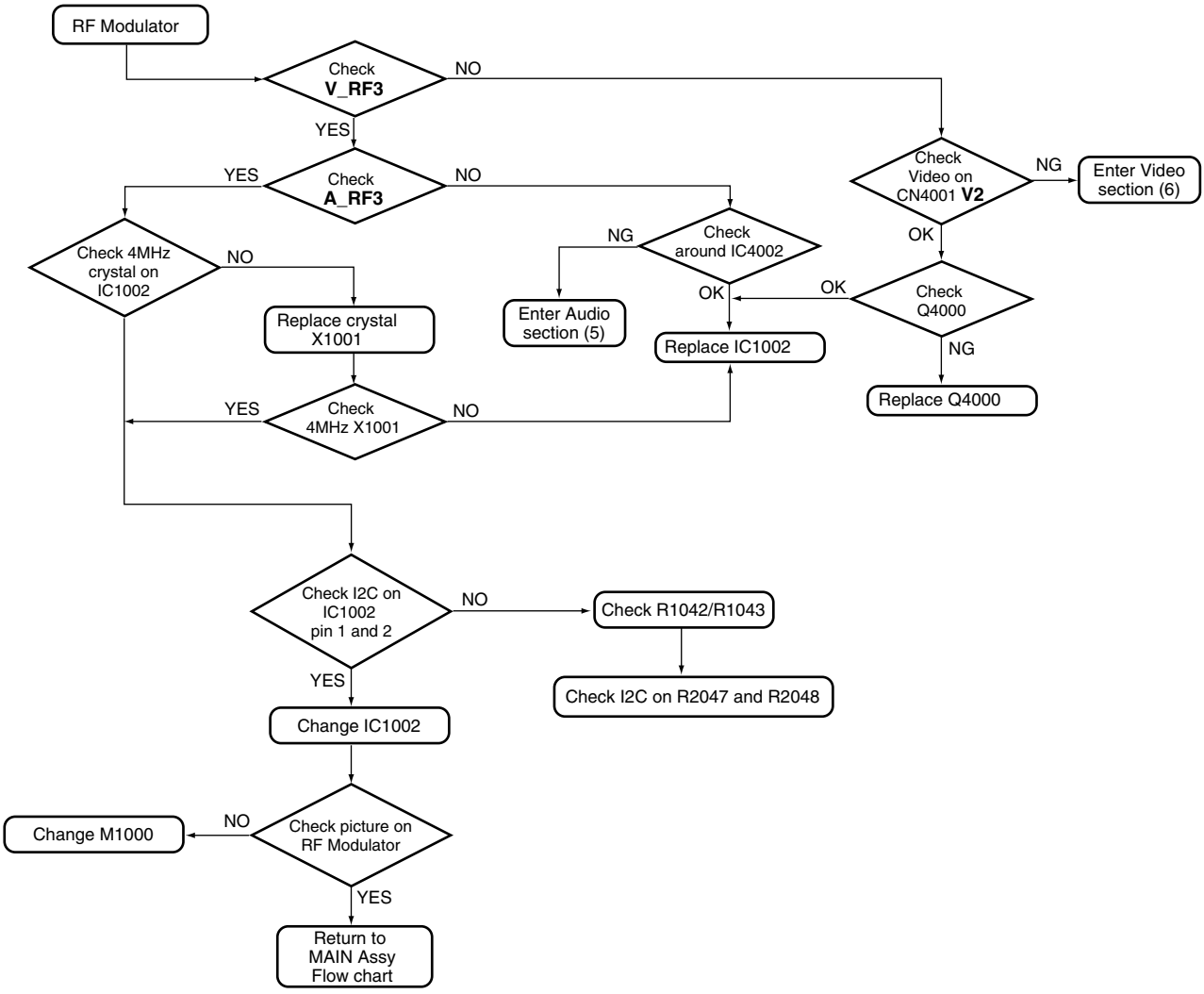
[EMI Troubleshooting Section (2)]



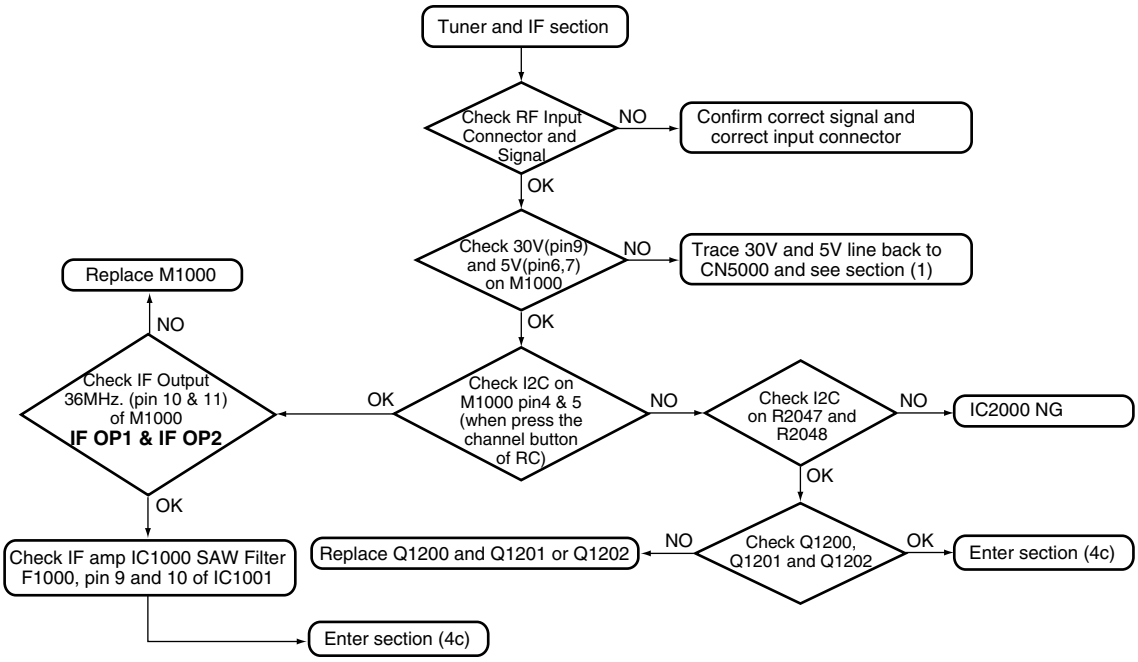
[SMI Troubleshooting Section (3)]
(IC3000)



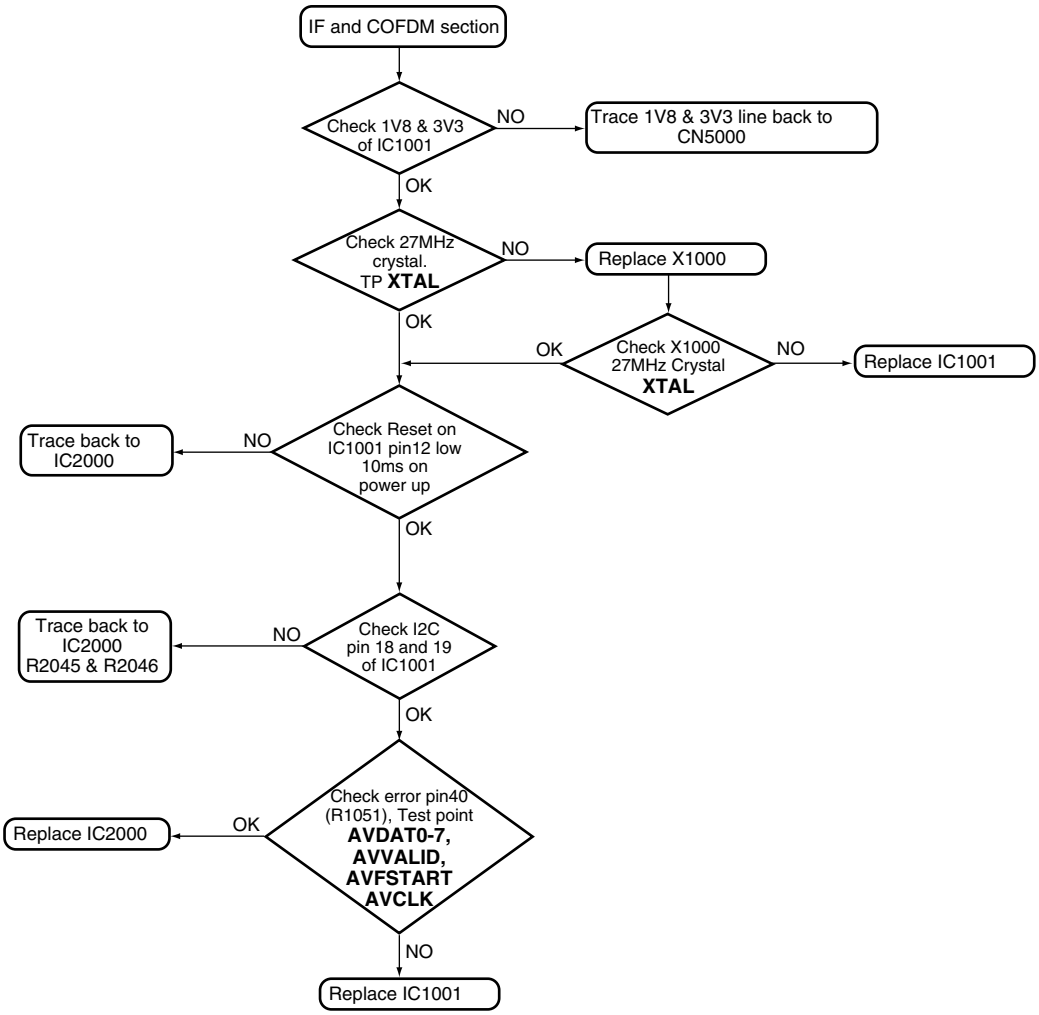
[Front End(FE) Troubleshooting Section (4a)]



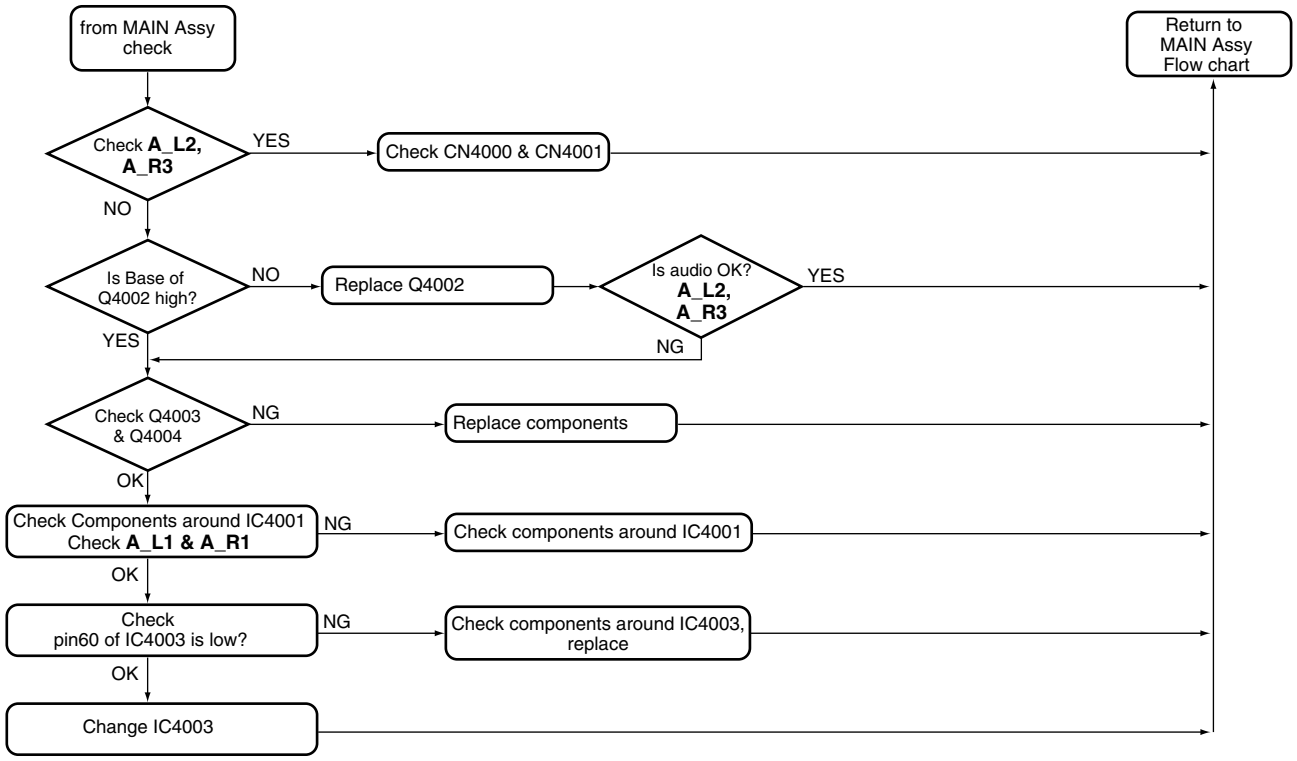
[Front End(FE) Troubleshooting Section (4b)]


Tuner and IF section
Check RF Input Connector and Signal
NO
Confirm correct signal and correct input connector
OK
Check 30V(pin9) and 5V(pin6,7) on M1000
NO
Trace 30V and 5V line back to CN5000 and see section (1)
OK
Replace M1000
NO
Check IF Output 36MHz. (pin 10 & 11) of M1000 IF OP1 & IF OP2
OK
Check I2C on M1000 pin4 & 5 (when press the channel button of RC)
NO
Check I2C on R2047 and R2048
NO
IC2000 NG
OK
OK
Check IF amp IC1000 SAW Filter F1000, pin 9 and 10 of IC1001
Replace Q1200 and Q1201 or Q1202
NO
Check Q1200, Q1201 and Q1202
OK
Enter section (4c)
Enter section (4c)

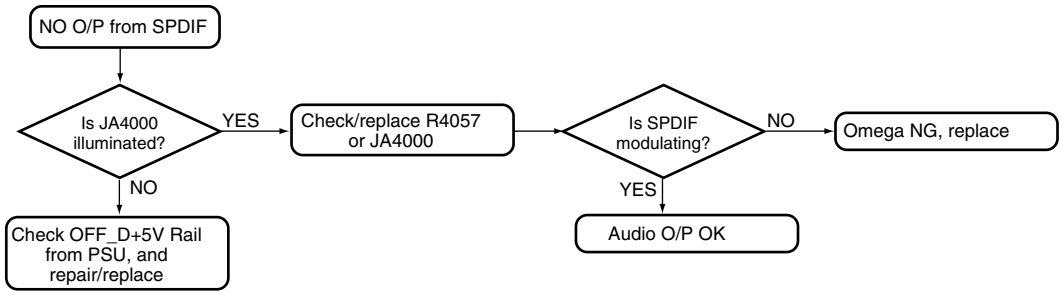
[Front End(FE) Troubleshooting Section (4c)]



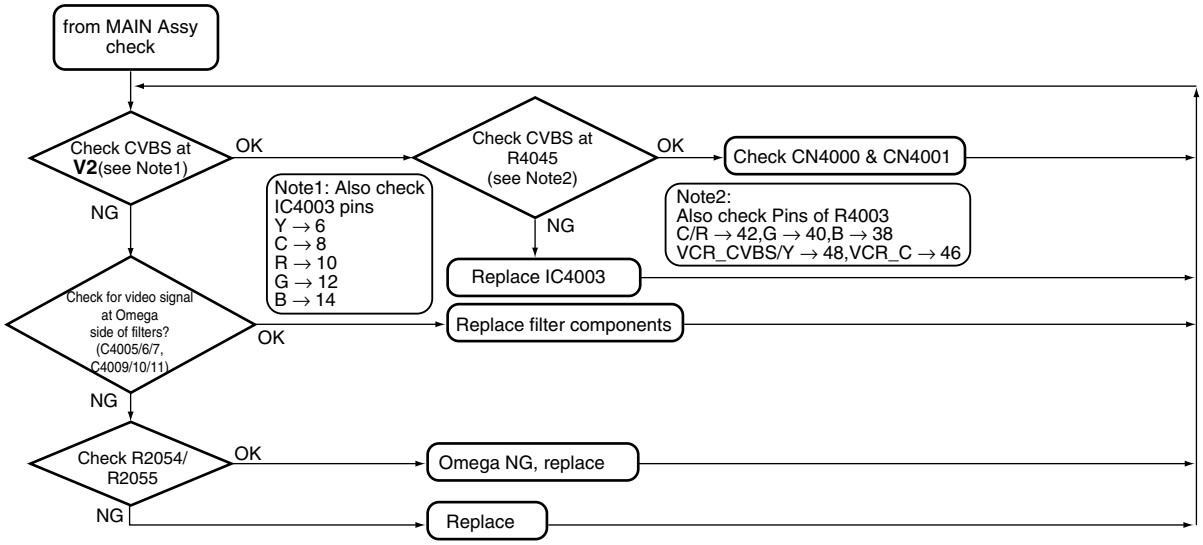
[Audio Troubleshooting Section (5)]



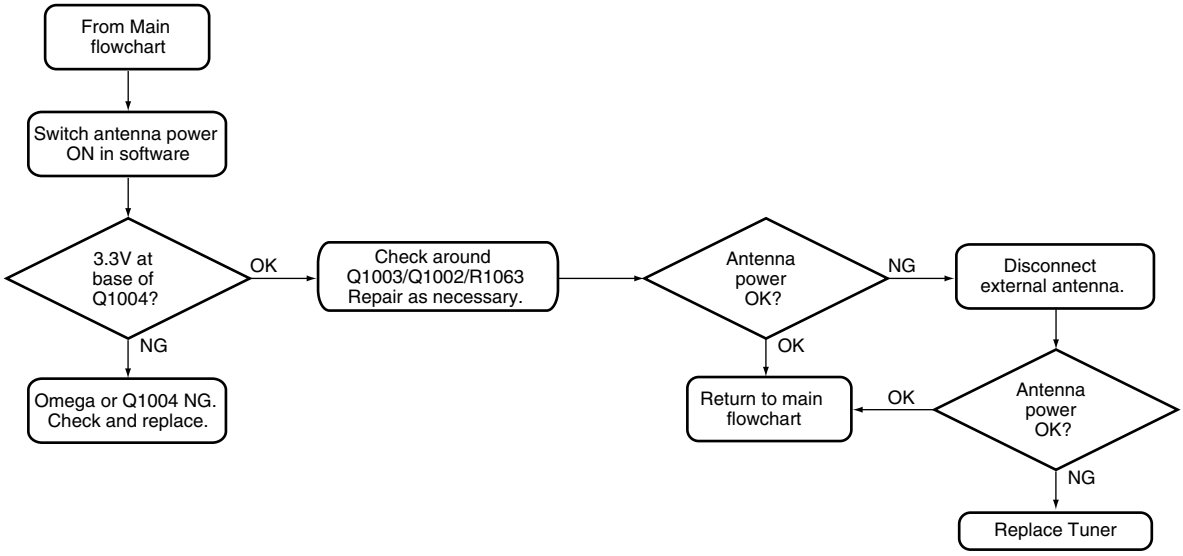
[SPDIF Troubleshooting Section (5a)]



[Video Troubleshooting Section (6)]



[Antenna Power Problems Troubleshooting Section (7)]



7.2 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

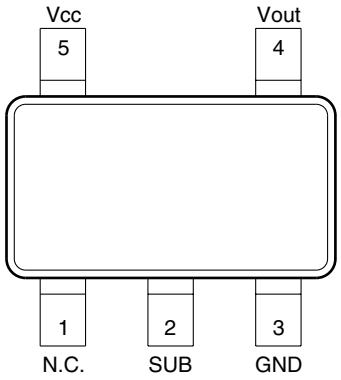
● **List of IC**

BD4720G, uPC3221GV, MC44BS373CAD, STV6413D, STV0360, STI5517AWA

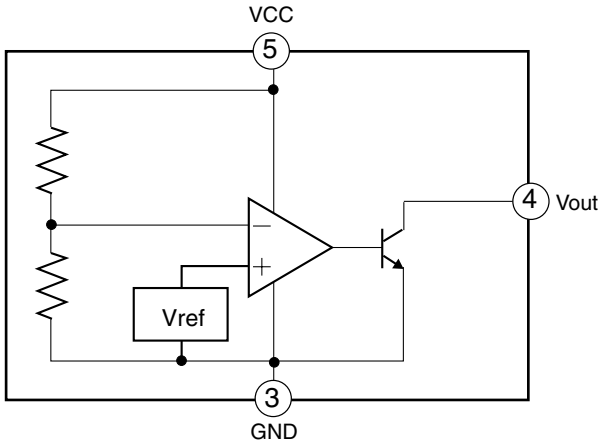
■ BD4720G (MAIN ASSY : IC2003)

• Reset IC

● **Pin Arrangement**



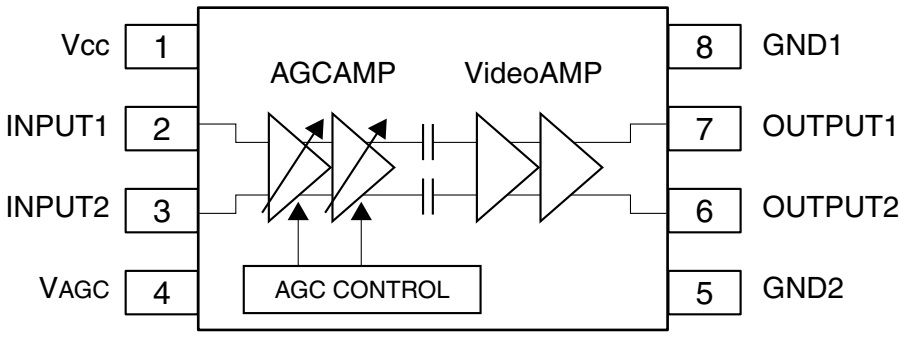
● **Block Diagram**



■ uPC3221GV (MAIN ASSY : IC1000)

• General Purpose 5V 100MHz AGC Amplifier

● **Block Diagram**



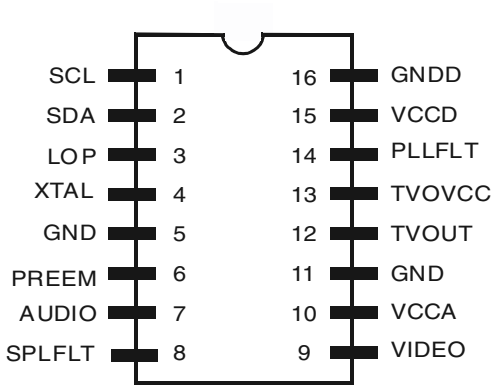
● **Pin Function**

No.	Pin Name	Function
1	Vcc	Power Supply pin.
2	INPUT1	Signal input pins to AGC amplifier.
3	INPUT2	
4	VAGC	Gain control pin.
5	GND2	Ground pin.
6	OUTPUT2	Signal output pins of video amplifier.
7	OUTPUT1	
8	GND1	Ground pin.

■ MC44BS373CAD/PC44BS373CAD (MAIN ASSY : IC1002)

• Modulator IC

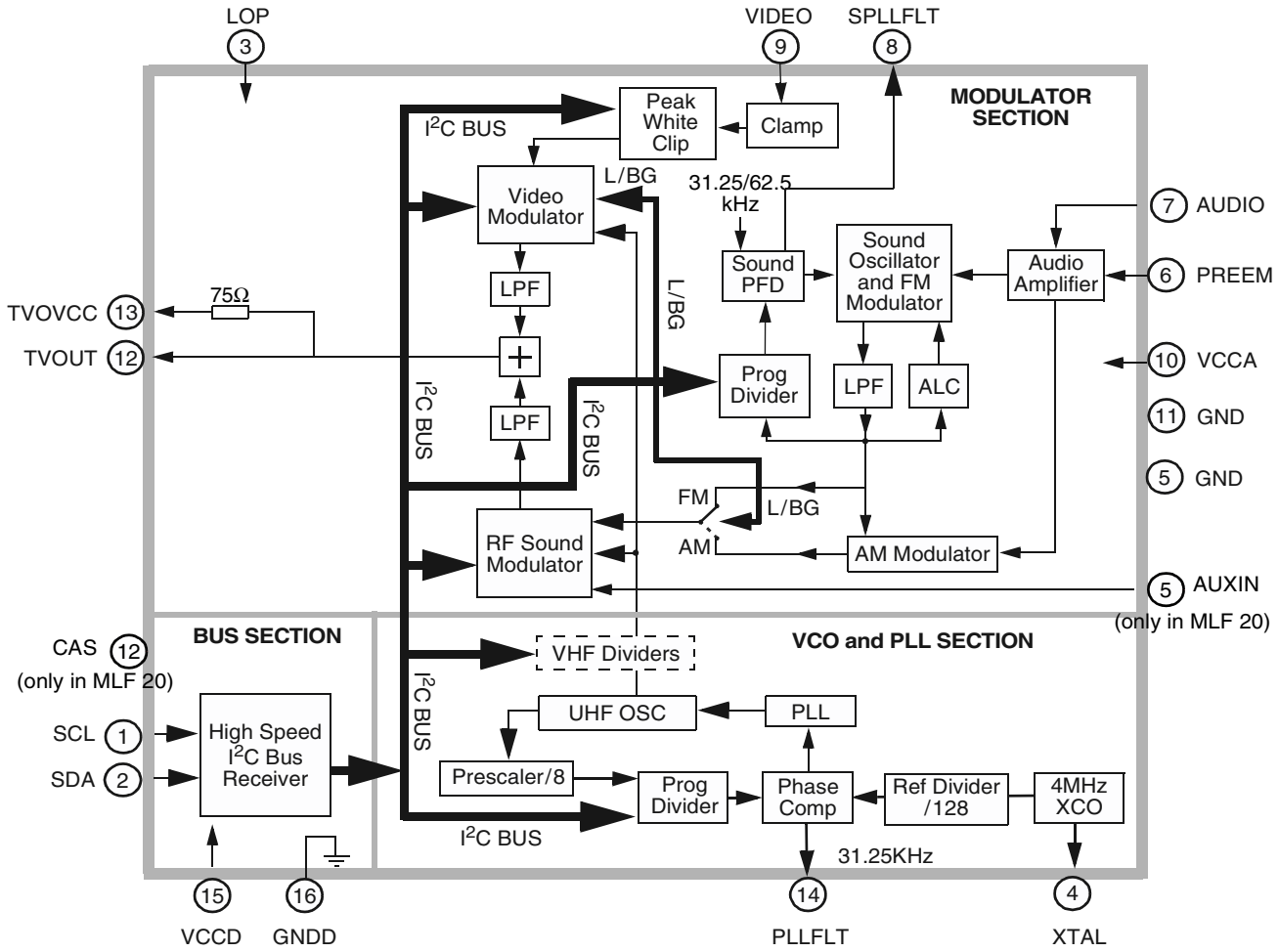
● Pin Arrangement



● Pin Function

No.	Pin Name	Function
1	SCL	I²C clock
2	SDA	I²C data
3	LOP	Logical output port controlled by I²C bus
4	XTAL	Crystal
5	GND	Ground
6	PREEMP	Pre-emphasis capacitor
7	AUDIO	Audio input
8	SPLFLT	Sound PLL loop filter
9	VIDEO	Video input
10	VCCA	Main analog supply voltage
11	GND	Analog ground
12	TVOUT	TV output signal
13	TVOVCC	TV output stage supply voltage
14	PLLFLT	RF PLL loop filter
15	VCCD	Digital supply voltage
16	GNDD	Digital ground

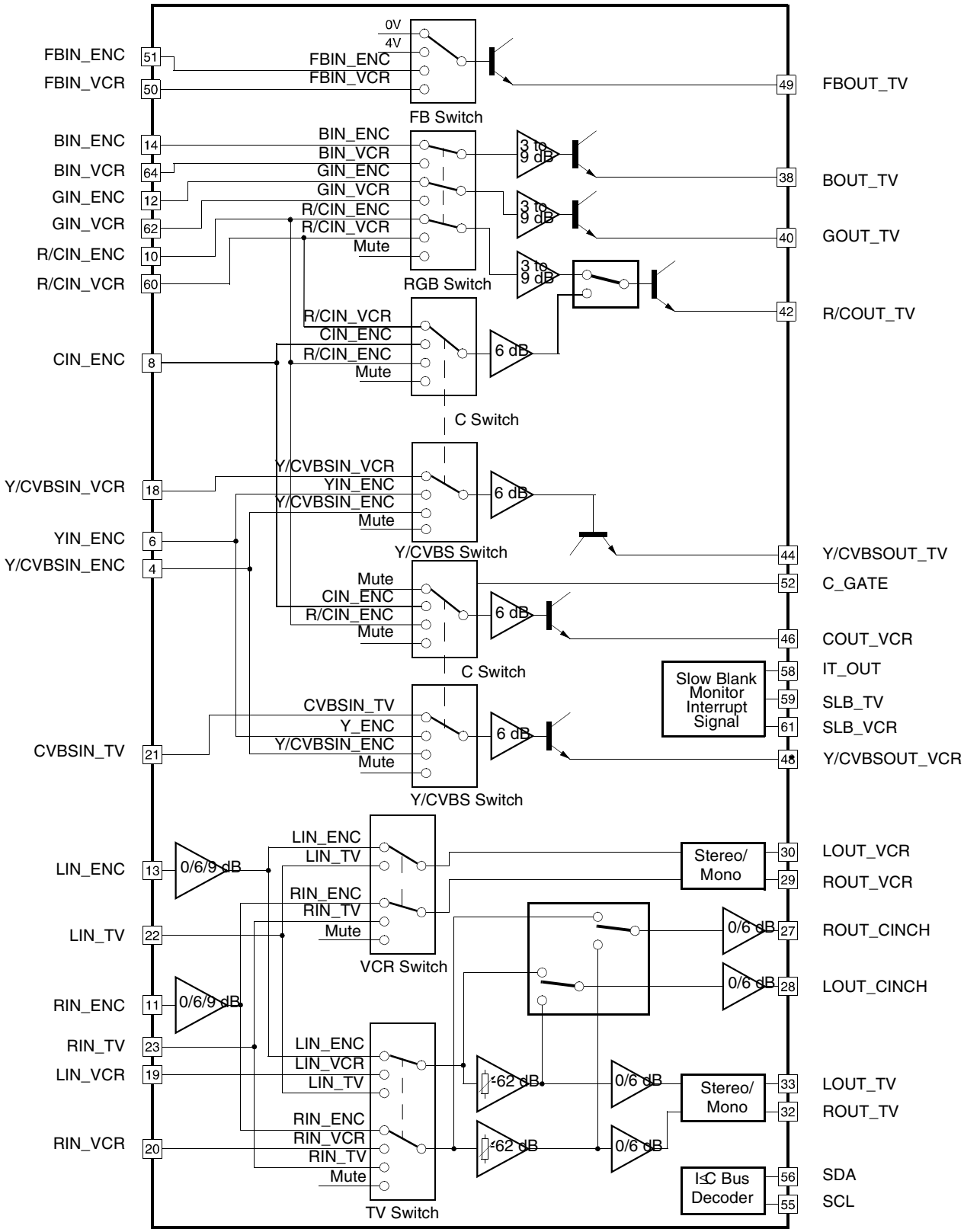
● Block Diagram



■ STV6413D (MAIN ASSY : IC4003)

• AV Switch IC

● Block Diagram



● Pin Function

No.	Pin Name	Function
1	VCC	+5 V Supply
2	NC	Not connected
3	DECV	Video Decoupling Capacitor
4	Y/CVBSIN_ENC	Y/CVBS Input from Encoder
5	GND	Ground
6	YIN_ENC	Y Input from Encoder
7	NC	Not connected
8	CIN_ENC	Chroma Input from Encoder
9	NC	Not connected
10	R/CIN_ENC	Red/Chroma Input from Encoder
11	RIN_ENC	Audio Right, Input from Encoder
12	GIN_ENC	Green Input from Encoder
13	LIN_ENC	Audio Left, Input from Encoder
14	BIN_ENC	Blue Input from Encoder
15	NC	Not Connected
16	DECA	Audio Decoupling Capacitor
17	GND	Ground
18	Y/CVBSIN_VCR	Y/CVBS Input from VCR SCART
19	LIN_VCR	Audio Left, Input from VCR SCART
20	RIN_VCR	Audio Right, Input from VCR SCART
21	CVBSIN_TV	CVBS Input from TV SCART
22	LIN_TV	Audio Left, Input from TV SCART
23	RIN_TV	Audio Right, Input from TV SCART
24	VCCA	Audio Supply Voltage - or - Audio Supply Decoupling
25	GNDA	Audio Ground
26	NC	Not Connected
27	ROUT_CINCH	Audio Right Output to Cinch
28	LOUT_CINCH	Audio Left Output to Cinch
29	ROUT_VCR	Audio Right Output to VCR SCART
30	LOUT_VCR	Audio Left Output to VCR SCART
31	VCCAO	Audio Output Supply Voltage - or - Main Audio Supply Voltage
32	ROUT_TV	Audio Right Output to TV SCART
33	LOUT_TV	Audio Left Output to TV SCART
34	NC	Not connected
35	NC	Not connected
36	NC	Not connected
37	VCCB5	Video Output Buffer Supply Pin
38	BOUT_TV	Blue Output to TV SCART
39	VCCB4	Video Output Buffer Supply Pin
40	GOUT_TV	Green Output to TV SCART

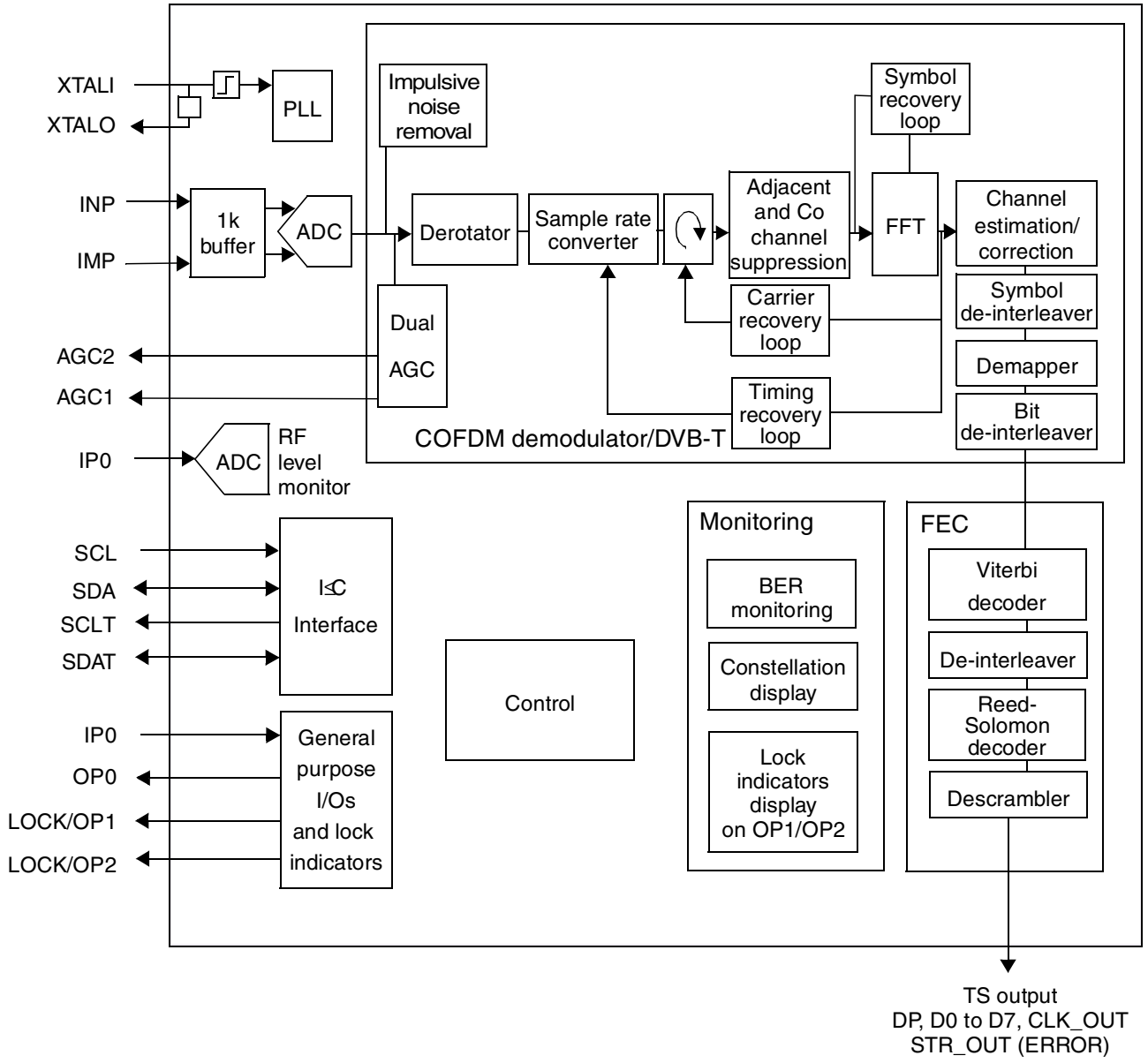
A B C D E F

No.	Pin Name	Function
41	GNDB	Video Buffer Ground
42	R/COUT_TV	Red/Chroma Output to TV SCART
43	VCCB3	Video Output Buffer Supply Pin
44	Y/CVBSOUT_TV	Y/CVBS Output to TV SCART
45	VCCB2	Video Output Buffer Supply Pin
46	COUT_VCR	Chroma Output to VCR SCART
47	VCCB1	Video Output Buffer Supply Pin
48	Y/CVBSOUT_VCR	Y/CVBS Output to VCR SCART
49	FBOUT_TV	Fast Blanking Output to TV SCART
50	FBIN_VCR	Fast Blanking Input from VCR SCART
51	FBIN_ENC	Fast Blanking Input from Encoder
52	C_GATE	External MOS Command for C_VCR bidirectional mode
53	VDD	+5 V I^2C Supply
54	NC	Not connected
55	SCL	I^2C Bus Clock
56	SDA	I^2C Bus Data
57	GND	Ground Digital
58	IT_OUT	Interrupt Output
59	SLB_TV	Slow Blanking Input/Output from TV SCART
60	R/CIN_VCR	Red Input (or C Input) from VCR SCART
61	SLB_VCR	Slow Blanking Input/Output from VCR SCART
62	GIN_VCR	Green Input from VCR SCART
63	VCC12	+12 V Supply
64	BIN_VCR	Blue Input from VCR SCART

■ STV0360 (MAIN ASSY : IC1001)

• COFDM LINK IC

● **Block Diagram**



● Pin Function

Clock and resets

No.	Pin Name	I/O	Function
12	$\overline{\text{RESET}}$	I	Hardware reset, active low
62	XTALI	I	Crystal oscillator input /external clock (1.8V)
63	XTALO	O	Crystal oscillator output
61	VCCXTAL1.8	–	Analog oscillator supply (1.8V)
64	GNDXTAL	–	Analog oscillator ground

Analog interface

No.	Pin Name	I/O	Function
2	DVCCA1.8	–	Analog part digital supply (1.8V)
5	REFM	–	Internal negative reference
6	REFP	–	Internal positive reference
3	VCCA1.8	–	Analog supply (1.8V)
9	INM	I	Negative analog input
10	INP	I	Positive analog input
4, 11	GNDA	–	Analog ground
1	DGNDA	–	Analog ground
7	VR	–	Reference
8	VCCA3.3	–	Analog supply (3.3V)

I²C interface

No.	Pin Name	I/O	Function
21	SDA	I/O	Serial data (open drain)
20	SCL	I	Serial clock (open drain)
19	SDAT	I/O	SDA tuner (open drain)
18	SCLT	I	SCL tuner

MPEG interface

No.	Pin Name	I/O	Function
25, 26, 27, 29, 31, 32, 33, 34	D7 : D0	O	Serial D7, MPEG data
36	CLK_OUT	O	MPEG byte or bit clock
23	STR_OUT	O	MPEG first byte sync
38	D/$\overline{\text{P}}$	O	MPEG data valid/parity
40	ERROR	O	MPEG packet error
51	HFEC0	O	Hierarchical FEC output bit 0
50	CCLK/HFEC1	O	Hierarchical FEC output bit 1 or clock for constellation display
49	CDATA/HFEC2	O	Hierarchical FEC output bit 2 or data for constellation display
48	CIQ/HFEC3	O	Hierarchical FEC output bit 3 or IQ validation for constellation display

Front end controls

No.	Pin Name	I/O	Function
16	AGC1	I/O	RF AGC control ΣΔ
14	AGC2	I/O	IF AGC control ΣΔ
17, 60	TEST	–	Reserved test mode, must be ground
58	IP0	I	General-purpose input port 0 and ADC input for RF level monitoring
45	OP0	I/O	General-purpose output port 0
43	LOCK/OP1	I/O	General-purpose output port 1 or lock indicator
42	LOCK/OP2	O	General-purpose output port 2 or lock indicator
47	AUX_CLK	I/O	Auxiliary clock
55	CS0	I	Chip select LSB
53	CS1	I	Chip select MSB

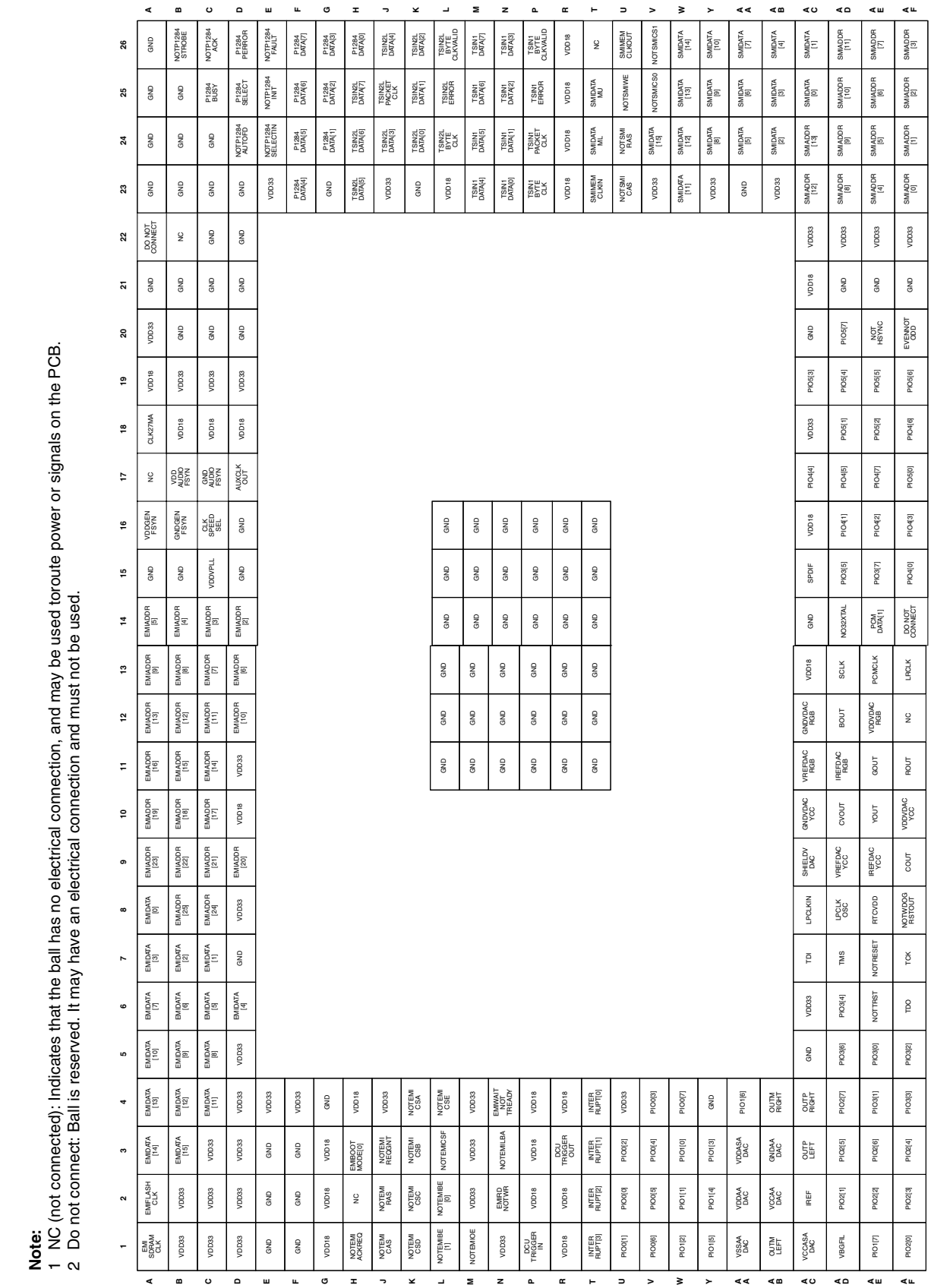
Power supply

No.	Pin Name	I/O	Function
13, 28, 39, 57	VDD	–	Digital core supply
22, 35, 44, 52	VDD_3.3	–	Digital I/O supply
15, 24, 30, 37, 41, 46, 54, 56, 59	GND	–	Ground

■ STI5517AWA (MAIN ASSY : IC2000)

• Prog. Transport IC

● Pin Arragement

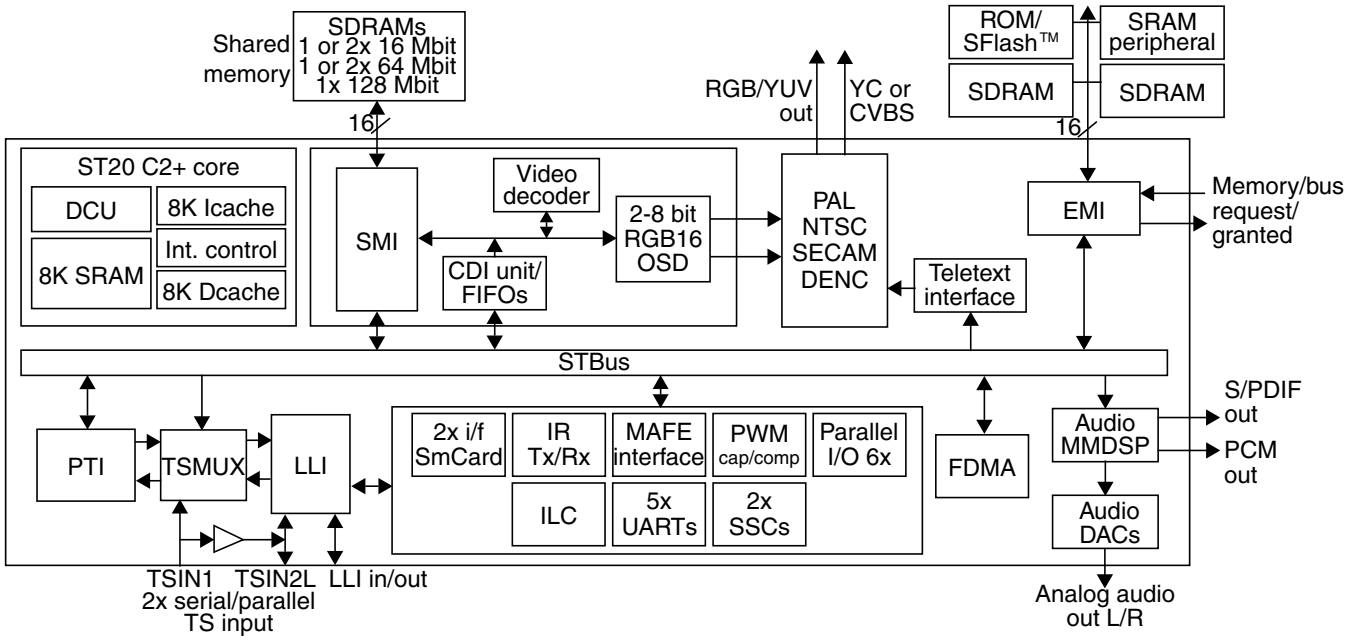

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
A EMI SDRAM CLK | EMIFLASH CLK | EMIDATA [14] | EMIDATA [13] | EMIDATA [10] | EMIDATA [7] | EMIDATA [3] | EMIDATA [0] | EMIADDR [23] | EMIADDR [19] | EMIADDR [16] | EMIADDR [13] | EMIADDR [9] | EMIADDR [5] | GND | VDDGEN FSYN | NC | CLK27MA | VDD18 | VDD33 | GND | DO NOT CONNECT | GND | GND | GND | GND
B VDD33 | EMIDATA [15] | EMIDATA [12] | EMIDATA [9] | EMIDATA [6] | EMIDATA [2] | EMIADDR [25] | EMIADDR [22] | EMIADDR [18] | EMIADDR [15] | EMIADDR [12] | EMIADDR [8] | EMIADDR [4] | VDDVPLL | GNDGEN FSYN | VDD AUDIO PSYN | VDD18 | VDD33 | GND | NC | GND | GND | GND | NOTP1284 STROBE
C VDD33 | VDD33 | EMIDATA [11] | EMIDATA [8] | EMIDATA [5] | EMIDATA [1] | EMIADDR [24] | EMIADDR [21] | EMIADDR [17] | EMIADDR [14] | EMIADDR [11] | EMIADDR [7] | EMIADDR [3] | GND | CLK SPEED SEL | GND AUDIO PSYN | VDD18 | VDD33 | GND | GND | GND | P1284 BUSY | NOTP1284 ACK
D VDD33 | VDD33 | VDD33 | VDD33 | VDD33 | EMIDATA [4] | GND | VDD33 | EMIADDR [20] | VDD18 | VDD33 | EMIADDR [10] | EMIADDR [6] | EMIADDR [2] | GND | GND | AUXCLK OUT | VDD18 | VDD33 | GND | GND | NOTP1284 AUTOFD | GND | NOTP1284 SELECT | P1284 PERROR
E GND | GND | GND | VDD33 | | | | | | | | | | | | | | | | | | | VDD33 | NOTP1284 SELECTIN | NOTP1284 INIT | NOTP1284 FAULT
F GND | GND | GND | VDD33 | | | | | | | | | | | | | | | | | | | P1284 DATA[4] | P1284 DATA[5] | P1284 DATA[6] | P1284 DATA[7]
G VDD18 | VDD18 | VDD18 | GND | | | | | | | | | | | | | | | | | | | GND | P1284 DATA[1] | P1284 DATA[2] | P1284 DATA[3]
H NOTEMI ACAREQ | NC | EMBOOT MODE[0] | VDD18 | | | | | | | | | | | | | | | | | | | TSIN2L DATA[6] | TSIN2L DATA[8] | TSIN2L DATA[7] | P1284 DATA[0]
J NOTEMI CAS | NOTEMI RAS | NOTEMI REQINT | VDD33 | | | | | | | | | | | | | | | | | | | VDD33 | TSIN2L DATA[3] | TSIN2L PACKET CLK | TSIN2L DATA[4]
K NOTEMI CSD | NOTEMI CSC | NOTEMI CSB | NOTEMI CSA | | | | | | | | | | | | | | | | | | | GND | TSIN2L DATA[0] | TSIN2L DATA[1] | TSIN2L DATA[2]
L NOTEMIBE [1] | NOTEMIBE [0] | NOTEMICSF | NOTEMI CSE | | | | | | | | | | | | | | | | | | | VDD18 | TSIN2L BYTE CLK | TSIN2L ERROR | TSIN2L BYTE CLKVALID
M NOTEMIOE | VDD33 | VDD33 | VDD33 | | | | | | | | | | | | | | | | | | | TSIN1 DATA[4] | TSIN1 DATA[5] | TSIN1 DATA[6] | TSIN1 DATA[7]
N VDD33 | EMIRD NOTWR | NOTEMILBA | EMIWAIT NOT_TREADY | | | | | | | | | | | | | | | | | | | TSIN1 DATA[0] | TSIN1 DATA[1] | TSIN1 DATA[2] | TSIN1 DATA[3]
P DCU TRIGGER IN | VDD18 | VDD18 | VDD18 | | | | | | | | | | | | | | | | | | | TSIN1 BYTE CLK | TSIN1 PACKET CLK | TSIN1 ERROR | TSIN1 BYTE CLKVALID
R VDD18 | INTER RUPT[2] | DCU TRIGGER OUT | INTER RUPT[1] | | | | | | | | | | | | | | | | | | | VDD18 | VDD18 | VDD18 | VDD18
T INTER RUPT[3] | INTER RUPT[0] | INTER RUPT[1] | INTER RUPT[0] | | | | | | | | | | | | | | | | | | | SMMEM CLKIN | NOTSMI CAS | NOTSMI RAS | NC
U PIO0[1] | PIO0[0] | PIO0[2] | VDD33 | | | | | | | | | | | | | | | | | | | VDD33 | SMDATA [15] | NOTSMI RAS | SMMEM CLKOUT
V PIO0[6] | PIO0[5] | PIO0[4] | PIO0[3] | | | | | | | | | | | | | | | | | | | SMDATA [13] | SMDATA [12] | SMDATA [11] | NOTSMICS0
W PIO1[2] | PIO1[1] | PIO1[0] | PIO0[7] | | | | | | | | | | | | | | | | | | | SMDATA [7] | SMDATA [14] | SMDATA [10] | SMDATA [9]
Y PIO1[5] | PIO1[4] | PIO1[3] | GND | | | | | | | | | | | | | | | | | | | VDD33 | SMDATA [8] | SMDATA [9] | SMDATA [10]
AA VSSAA DAC | VDDAA DAC | VDDASA DAC | PIO1[6] | | | | | | | | | | | | | | | | | | | GND | SMDATA [6] | SMDATA [8] | SMDATA [7]
AB OUTM LEFT | VCCAA DAC | GNDAA DAC | OUTM RIGHT | | | | | | | | | | | | | | | | | | | VDD33 | SMDATA [5] | SMDATA [2] | SMDATA [4]
AC VCCASA DAC | IREF | OUTP LEFT | OUTP RIGHT | GND | VDD33 | TDI | LPCLKIN | SHIELDV DAC | GNDVDAC YCC | VREFDAC RGB | GNDVDAC RGB | VDD18 | GND | SPDIF | PIO4[4] | VDD18 | VDD33 | VDD18 | GND | VDD33 | SMADDR [12] | SMADDR [13] | SMDATA [0] | SMDATA [1]
AD VBGFIL | PIO2[1] | PIO2[5] | PIO2[7] | PIO3[6] | PIO3[4] | TMS | LPCLK OSC | VREFDAC YCC | IREFDAC RGB | BOUT | SCLK | NO32XTAL | PIO3[5] | PIO4[1] | PIO4[5] | PIO5[1] | PIO5[4] | PIO5[7] | GND | VDD33 | SMADDR [4] | SMADDR [9] | SMADDR [10] | SMADDR [1]
AE PIO1[7] | PIO2[2] | PIO2[6] | PIO3[1] | PIO3[0] | NOTTRST | NOTRESET | RTCVDD | IREFDAC YCC | COUT | VDDYDAC YCC | YOUT | VDDVDAC RGB | PCMCLK | PCM_DATA[1] | PIO4[7] | PIO5[2] | PIO5[5] | NOT HSYNC | GND | VDD33 | SMADDR [5] | SMADDR [6] | SMADDR [7]
AF PIO2[0] | PIO2[3] | PIO2[4] | PIO3[3] | PIO3[2] | TDO | TCK | NOTWDOG RSTOUT | COUT | ROUT | NC | LRCLK | DO NOT CONNECT | PIO4[0] | PIO4[3] | PIO5[0] | PIO4[6] | PIO5[6] | EVENNOT ODD | GND | VDD33 | SMADDR [0] | SMADDR [1] | SMADDR [2] | SMADDR [3]

Note:

1 NC (not connected): Indicates that the ball has no electrical connection, and may be used toroute power or signals on the PCB.

2 Do not connect: Ball is reserved. It may have an electrical connection and must not be used.

● Block Diagram



● Pin Function

Analog power supply pins

Pin Name	Location	No.	Function
VDDVDACRGB	AE12	1	3.3 V power supply for RGB video DAC
VDDVDACYCC	AF10	1	3.3 V power supply for YCC video DAC
GNDVDACRGB	AC12	1	Ground for RGB video DAC
GNDVDACYCC	AC10	1	Ground for YCC video DAC
SHIELDVDAC	AC9	1	Shield ground for 2 x video DACs
IREFDACRGB	AD11	1	RGB video DAC current reference
IREFDACYCC	AE9	1	YCC video DAC current reference
VREFDACRGB	AC11	1	RGB video DAC voltage reference
VREFDACYCC	AD9	1	YCC video DAC voltage reference
VDDVPLL	C15	1	3.3 V power for video PLL
VDDAUDIOFSYN	B17	1	1.8 V dedicated power for low jitter audio clock frequency synthesizer
GNDAUDIOFSYN	C17	1	Dedicated ground for low jitter audio clock frequency synthesizer
VDDGENFSYN	A16	1	1.8 V dedicated power for nonaudio clock frequency synthesizer
GNDGENFSYN	B16	1	Dedicated ground for nonaudio clock frequency synthesizer
VDDAADAC	AA2	1	3.3 V power for audio DAC
VSSAADAC	AA1	1	Ground for audio DAC command switches
VDDASADAC	AA3	1	3.3 V power for audio DAC substrate
VCCAADAC	AB2	1	3.3 V power for audio DAC command switches
GNDAADAC	AB3	1	Ground for audio DAC
VCCASADAC	AC1	1	3.3 V power for audio DAC command switches substrate
IREF	AC2	1	Audio DAC output reference current
VBGFIL	AD1	1	Audio DAC filtered output reference voltage

Digital power supply pins

Pin Name	Location	No.	Function
VDD18	a	24	1.8 V power supply
VDD33	b	35	3.3 V power supply
RTCVDD	AE8	1	Low power controller 1.8 V power supply
GND	c	76	Ground for power supplies

a : A19, B18, B22, C18, D10, D18, G1 to G3, H4, L23, P2 to P4, R1, R2, R4, R23 to R26, AC13, AC16 and AC21.
b : A20, B1, B2, B19, C1 to C3, C19, D1 to D5, D8, D11, D19, E4, E23, F4, J4, J23, M2 to M4, N1, U4, V23, Y23, AB23, AC6, AC18, AC22, AD22, AE22 and AF22.
c : A15, A21, A23 to A26, B15, B20, B21, B22, B23 to B25, C20 to C24, D7, D15, D16, D20 to D23, E1 to E3, F1 to F3, G4, G23, K23, L11 to L16, M11 to M16, N11 to N16, P11 to P16, R11 to R16, T11 to T16, Y4, AA23, AC5, AC14, AC20, AD21, AE21 and AF21.

RTC pins

Pin Name	Location	I/O	Function
LPCLKIN [a]	AC8	I	Low power clock input
LPCLKOSC [a]	AD8	I/O	Low power clock oscillator
NO32XTAL	AD14	I	Select for 32 kHz clock source 0: XTAL, 1: Internal divider

a : 1.8 V tolerant

System pins

Pin Name	Location	I/O	Function
CLK27MA [a]	A18	I	Selectable input clock to PLL or for x1 mode
CLKSPEEDSEL [a]	C16	I	PLL speed select
AUXCLKOUT [a]	D17	O	Auxiliary clock for general use
NOTRESET [b]	AE7	I	System reset
NOTWDOGRSTOUT [a]	AF8	O	Internal watchdog timer reset.

a : 5 V tolerant
b : 1.8 V tolerant

JTAG pins

Pin Name	Location	I/O	Function
TDI [a]	AC7	I	Boundary scan test data input
TMS [a]	AD7	I	Boundary scan test mode select
TCK [a]	AF7	I	Boundary scan test clock
NOTTRST [a]	AE6	I	Boundary scan test logic reset
TDO [a]	AF6	O	Boundary scan test data output

a : 5 V tolerant

DCU pins

Pin Name	Location	I/O	Function
DCUTRIGGERIN [a]	P1	I	External trigger input to DCU
DCUTRIGGEROUT [a]	R3	O	Signal to trigger external debug circuitry

a : 5 V tolerant

EMI pins [a]

Pin Name	Location	I/O	Function
NOTEMIRAS or NOTCI_IORD [b]	J2	O	Row address strobe for SDRAM
NOTEMICAS or NOTCI_IOW [b]	J1	O	Column address strobe for SDRAM
NOTEMICSA	K4	O	Peripheral chip select A
NOTEMICSB	K3	O	Peripheral chip select B
NOTEMICSC	K2	O	Peripheral chip select C
NOTEMICSD	K1	O	Peripheral chip select D
NOTEMICSE	L4	O	Peripheral chip select E
NOTEMICSF	L3	O	Peripheral chip select F
NOTEMIBE[1:0]	L1, L2	O	External device data bus byte enable. 1 bit per byte of the data bus.
NOTEMIOE or NOTCI_OE	M1	O	External device output enable.
NOTEMILBA or NOTCI_WEA	N3	O	Flash device load burst address.
EMIWAITNOTTREADY [c]	N4	I	External memory device target ready indicator
EMIRDNOTWR	N2	O	External read/write access indicator. Common to all devices.
EMIDATA[15:0]	d	I/O	External common data bus.
EMIADDR[25:2] [e]	f	O	External common address bus
NOTEMIREQGNT	J3	O	Bus request/grant indicator
NOTEMIACKREQ [c]	H1	I	Bus grant/request indicator
EMIBOOTMODE0 [c]	H3	I	External power-up port size indicator
EMISDRAMCLK	A1	O	SDRAM clock
EMIFLASHCLK	A2	O	Peripheral clock

a : The EMI interface has controllable pull-ups, with two independent controls in CONFIG_CONTOL_E[30:29] (EMI_PULLUP_ENABLE_A and EMI_PULLUP_ENABLE_B)

b : Or equivalent ATA HDD interface signal.

c : 5 V tolerant

d : B3, A3, A4, B4, C4, A5, B5, C5, A6, B6, C6, D6, A7, B7, C7 and A8.

e : EMIADDR[19:20] are used as ATA HDD interface function: ATA CS0 and CS1. There is no interconnect configuration control register bit to select this function. The addresses are just reused as chip selects.

f : B8, C8, A9, B9, C9, D9, A10, B10, C10, A11, B11, C11, A12, B12, C12, D12, A13, B13, C13, D13, A14, B14, C14 and D14.

Transport stream 2 pins

Pin Name	Location	I/O	Function
TSIN2LBYTECLK [a]	L24	I	Transport stream clockb
TSIN2LBYTECLKVALID [a]	L26	I/O	Transport stream clock valid edge
TSIN2LERROR [a]	L25	I/O	Transport stream packet errorc
TSIN2LPACKETCLK [a]	J25	I/O	Transport stream packet strobe
TSIN2LDATA[7:0] [a]	d e	I/O	Transport stream data

a : 5 V tolerant

b : Input for TSIN2L and TSIN3 (1394).

c : Output as TSIN1 byte clock signal.

d : H25, H24, H23, J26, J24, K26, K25 and K24

e : TSIN2LDATA7 is used for data input in serial mode.

Transport stream 1 pins

Pin Name	Location	I/O	Function
TSIN1BYTECLK [a]	P23	I	Transport stream bit/byte clock
TSIN1BYTECLKVALID [a]	P26	I	Transport stream bit/byte clock valid edge
TSIN1ERROR [a]	P25	I	Transport stream packet error
TSIN1PACKETCLK [a]	P24	I	Transport stream packet strobe
TSIN1DATA[7:0] [a]	b, c	I	Transport stream data in

a : 5 V tolerant
b : M26, M25, M24, M23, N26, N25, N24 and N23.
c : TSIN1DATA7 is used for data input in serial mode.

Programmable I/O pins

Pin Name	Location	I/O	Function
PIO0[0:7] [a]	b	I/O	Parallel input/output pin or alternative function
PIO1[0:7] [a]	c	I/O	
PIO2[0:7] [a]	d	I/O	
PIO3[0:7] [a]	e	I/O	
PIO4[0:7] [a]	f	I/O	
PIO5[0:7] [a]	g	I/O	

a : 5 V tolerant
b : U2, U3, U1, V4, V3, V2, V1 and W4
c : W3, W2, W1, Y3, Y2, Y1, AA4 and AE1
d : AF1, AD2, AE2, AF2, AF3, AD3, AE3 and AD4
e : AE5, AE4, AF5, AF4, AD6, AD15, AD5 and AE15
f : AF15, AD16, AE16, AF16, AC17, AD17, AF18 and AE17
g : AF17, AD18, AE18, AC19, AD19, AE19, AF19 and AD20

Digital audio pins [a]

Pin Name	Location	I/O	Function
SCLK [b]	AD13	O	Serial clock
PCMDATA[1] [b]	AE14	O	PCM data out
PCMCLK [b]	AE13	I/O	External PCM clock input or internal PCM clock output
LRCLK [b]	AF13	O	Left/right clock
SPDIF [b]	AC15	O	Digital audio output

a : Note: Digital audio input pins PCMI_SCLK, PCMI_DATA and PCMI_LRCLK are alternate functions for NOT_CD_REQ[1], I1284HOSTLOGICHIGH, and NOT_CD_REQ[0], on PIO port 3 bits [6:4]
b : 5 V tolerant

AVSDRAM pins (SMI)

Pin Name	Location	I/O	Function
SMIADDR[13:0]	a	O	Audio/video core SDRAM address bus
SMIDATA[15:0]	b	I/O	Audio/video core SDRAM data bus
NOTSMICS0	V25	O	Audio/video core SDRAM chip select for 1st SDRAM
NOTSMICS1	V26	O	Audio/video core SDRAM chip select for 2nd 16 Mbit SDRAM
NOTSMICAS	U23	O	Audio/video core SDRAM column address strobe
NOTSMIRAS	U24	O	Audio/video core SDRAM row address strobe
NOTSMIWE	U25	O	Audio/video core SDRAM write enable
SMIMEMCLKIN	T23	I	Audio/video core SDRAM memory clock input
SMIMEMCLKOUT	U26	O	Audio/video core SDRAM memory clock output
SMIDATAML	T24	O	Audio/video core SDRAM data bus lower byte enable
SMIDATAMU	T25	O	Audio/video core SDRAM data bus upper byte enable

a : AC24, AC23, AD26, AD25, AD24, AD23, AE26, AE25, AE24, AE23, AF26, AF25, AF24 and AF23.
b : V24, W26, W25, W24, W23, Y26, Y25, Y24, AA26, AA25, AA24, AB26, AB25, AB24, AC26 and AC25.

IEEE 1284 / 1394 pins

Pin Name	Location	I/O	Function
P1284DATA[7:0] [a]	b	I/O	1284 data or 1394 AV data
NOTP1284SELECTIN [a]	E24	I/O	1284 or 1394 AV control signals
NOTP1284INIT [a]	E25	I/O	
NOTP1284FAULT [a]	E26	I/O	
NOTP1284AUTOFD [a]	D24	I/O	
P1284SELECT [a]	D25	I/O	
P1284PERROR [a]	D26	I/O	
P1284BUSY [a]	C25	I/O	
NOTP1284ACK [a]	C26	I/O	
NOTP1284STROBE [a]	B26	I/O	

a : 5 V tolerant
b : F26, F25, F24, F23, G26, G25, G24 and H26.

Interrupt pins

Pin Name	Location	I/O	Function
INTERRUPT[3:0] [a]	b	I/O	External interrupts

a : 5 V tolerant
b : T1, T2, T3 and T4.

Analog audio DAC (digital-to-analog converter) pins

Pin Name	Location	I/O	Function
OUTPLEFT	AC3	O	Left channel, differential positive current output
OUTMLEFT	AB1	O	Left channel, differential negative current output
OUTPRIGHT	AC4	O	Right channel, differential positive current output
OUTMRIGHT	AB4	O	Right channel, differential negative current output

Analog video DAC pins

Pin Name	Location	I/O	Function
ROUT	AF11	O	Red output
GOUT	AE11	O	Green output
BOUT	AD12	O	Blue output
COUT	AF9	O	Chroma output
CVOUT	AD10	O	Composite video output
YOUT	AE10	O	Luma output

Analog video DAC pins

Pin Name	Location	I/O	Function
NOTHSYNC [a]	AE20	I/O	Horizontal sync
EVENNOTODDA	AF20	I/O	Vertical sync

a : 5 V tolerant

7.3 MOUNTING CONDITION FOR BGA

1. OMEGA(Programble Transport IC)_STi5517AW

1.1 Resistance classification of solder reflow

The heat-resistance property of solder depends on package design and chip size. The JEDEC (Joint Electron Device Engineering Council) standards classify and define the term of viability after opening antihumidity packaging until accomplishment of solder reflow as MSL (Moisture Sensitivity Level).

MSL	Storage environment	Term of viability
3	30deg.C/60%RH	168 hours

MSL classification

Note
The MSL classification we employ conforms to JEDEC-STD-020 and JESD22-A112. (The latest revision JEDEC-STD-020A uses more detailed classifications, to which our products do not correspond.)

1.2 Recommended reflow conditions

1.2.1 Recommended temperature profile (IR reflow and hot-air reflow)

The recommended temperature profile for IR (infrared) reflow and hot-air reflow is shown in Figure 2.
The number of times of reflow should be three or less.

For IR reflow it is recommended to use a reflow device which uses middle or far infrared radiation.
When compared with middle and far infrared radiation, higher infrared-heat absorption rate on the mold resins and larger heat stress would be measured with near infrared radiation.

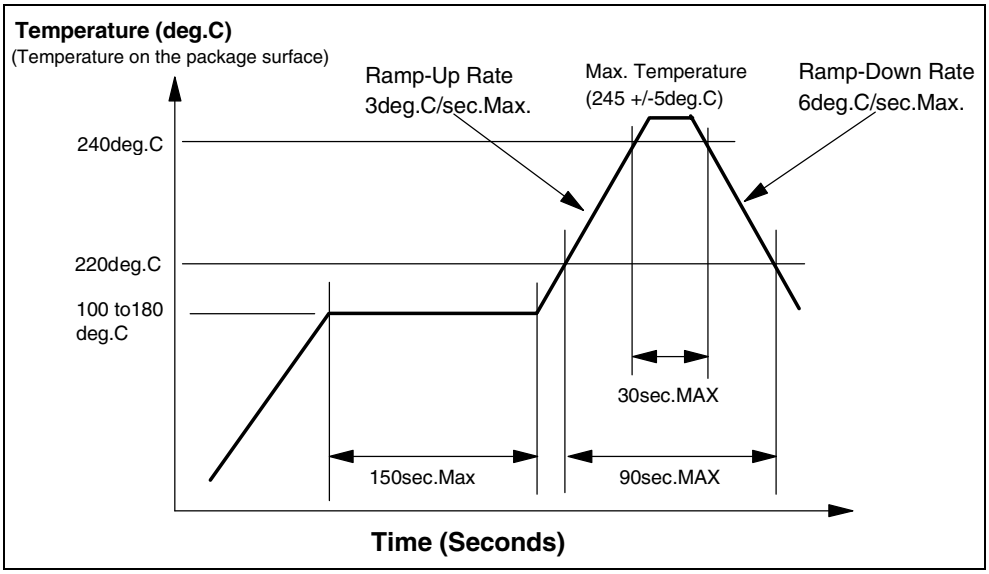


Figure 1: Recommended temperature profile (conforming to JEDEC-STD-020)

Time from Room Temperature to Peak 240 to 360 sec.

1.3 Requirements for storage and baking after opening the antihumidity packaging (dry bag)

After a dry pack has been opened, all SMD packages within that bag must complete all solder reflow processing, including rework, within 168 hours (1 week), unless opened parts are stored in a dry cabinet at <10% RH. After this time, parts must be baked as per the below conditions before use.

Heatproof trays (you will see clear “Heat Proof Tray” markings) are employed for some products. If the term of viability after opening the antihumidity packaging elapses during your manufacturing span, be sure to apply a baking process to the products with the heatproof tray before mounting the products.
The recommended baking conditions are as follows:

at 125 degrees C for 24 hours

1.4 Analysis of nonconforming items

When you remove our semiconductor products to analyze a nonconforming item, it is recommended to remove them after baking under the conditions mentioned in 1.3 above. If you remove the product using hot air in a status where the resin has absorbed moisture, heat stress may cause package cracking or adhesion degradation of the resin, and the actual reason for nonconformity may not found easily.

7.4 CAUTION FOR PCB ASSY SERVICING

During servicing, please observe the following important points.

1. Scart socket copper clips

- Ensure that the gap between these clips is as large as possible.
- Ensure that each leg of the clip touches the rear panel.

2. Bottom can

- It is important that the fingers on the bottom can touch the chassis.
  Before re-fitting the PCB, bend the fingers up to approximately 45 degrees.
- 2 points on the bottom can must be soldered to reduce the noise (see figure 3).

3. 5V Power supply

- Be carefull not to short the 5V supply lines. If this occurs, the IC protector P301 on the POWER Assy will blow.

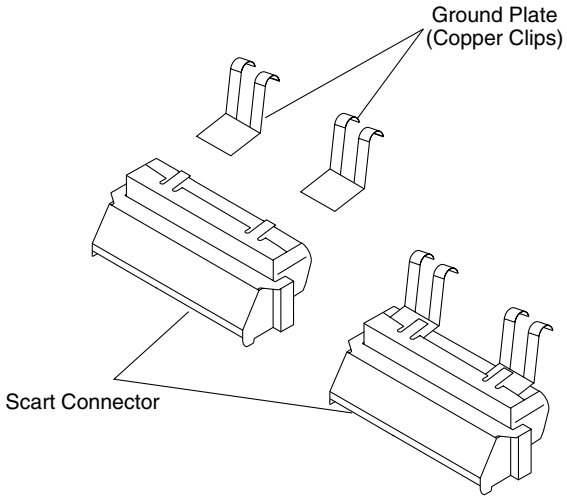


Fig.1 Scart socket copper clips

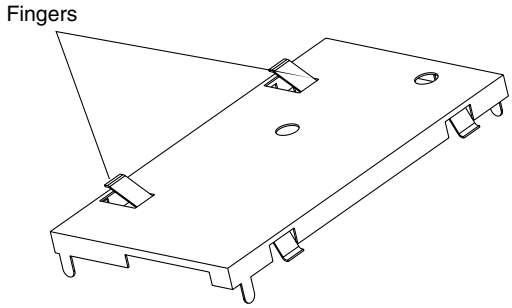


Fig.2 Tuner Bottom Can

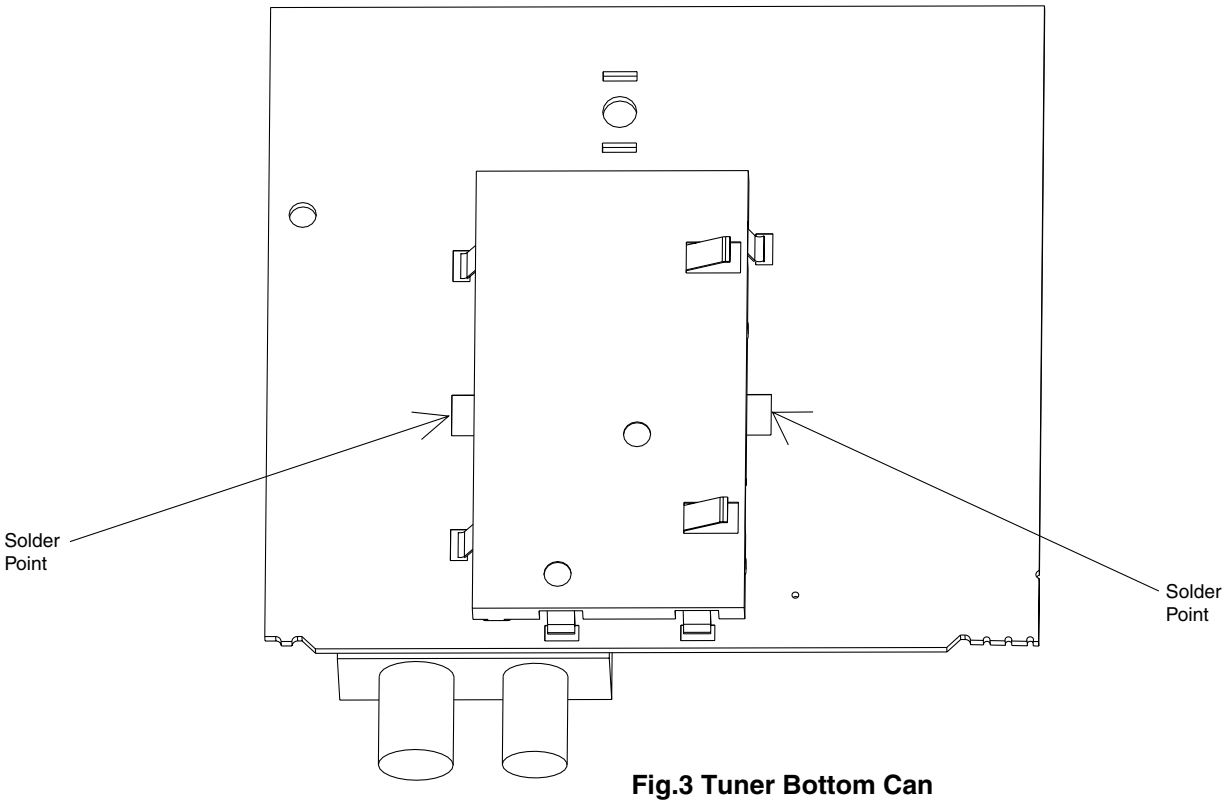


Fig.3 Tuner Bottom Can

7.5 TEST POINTS INSTRUCTION

(1) TEST PAD

Wiring Number	Indicate	Description	Wave Form No.
CK2001	SCL1	Clock of main I2C	⑪ MAIN_2/5
CK2002	SDAT1	Data of main I2C	⑫ MAIN_2/5
CK4002	V1	CVBS input from TV SCART	
CK4001	V2	CVBS output from OMEGA	㉖ MAIN_4/5
CK4006	A_R2	Audio R out on TV SCART	㉚ MAIN_4/5
CK4004	A_L2	Audio L out on TV SCART	㉙ MAIN_4/5
CK4005	A_R1	Audio R after LPF	㉘ MAIN_4/5
CK4003	A_L1	Audio L after LPF	㉗ MAIN_4/5
CK5002	XSTBY	STBY switch signal	㉛ MAIN_4/5
CK5003	OFF5V	OFF 5.0V	
CK1000	V_RF3	Composite video signal for RF	② MAIN_1/5
CK1001	A_RF3	LR mixed Audio for RF	③ MAIN_1/5
CK1002	XTAL	27MHz X'tal for COFDM IC	④ MAIN_1/5
CK1003	LOCK	H : channel lock, L : unlock	⑤ MAIN_1/5
K5000	OFF1V8	OFF 1.8V	
K5001	OFF3V3	OFF 3.3V	

(2) The Pins of M1000

Pin Name	Indicate	Description	Wave Form No.
1 pin	TVOUT	UHF signal (need spectrum analyzer)	
10 pin	IF_OP2	approx. 1Vpp and 36MHz signal	① MAIN_1/5
11 pin	IF_OP1	approx. 1Vpp and 36MHz signal	① MAIN_1/5

(3) Through Hole Terminal (Transport stream from COFDM IC)

Bus Line Name	Indicate	Description (STREAM signal)	Wave Form No.
TS1_9	AVVALID	Valid	⑥ MAIN_1/5
TS1_8	AVCLK	Clock	⑦ MAIN_1/5
TS1_0	AVDAT0	Data 0	⑧ MAIN_1/5
TS1_1	AVDAT1	Data 1	⑧ MAIN_1/5
TS1_2	AVDAT2	Data 2	⑧ MAIN_1/5
TS1_3	AVDAT3	Data 3	⑧ MAIN_1/5
TS1_4	AVDAT4	Data 4	⑧ MAIN_1/5
TS1_5	AVDAT5	Data 5	⑧ MAIN_1/5
TS1_6	AVDAT6	Data 6	⑧ MAIN_1/5
TS1_7	AVDAT7	Data 7	⑧ MAIN_1/5
TS1_10	AVFSTART	Start	⑨ MAIN_1/5

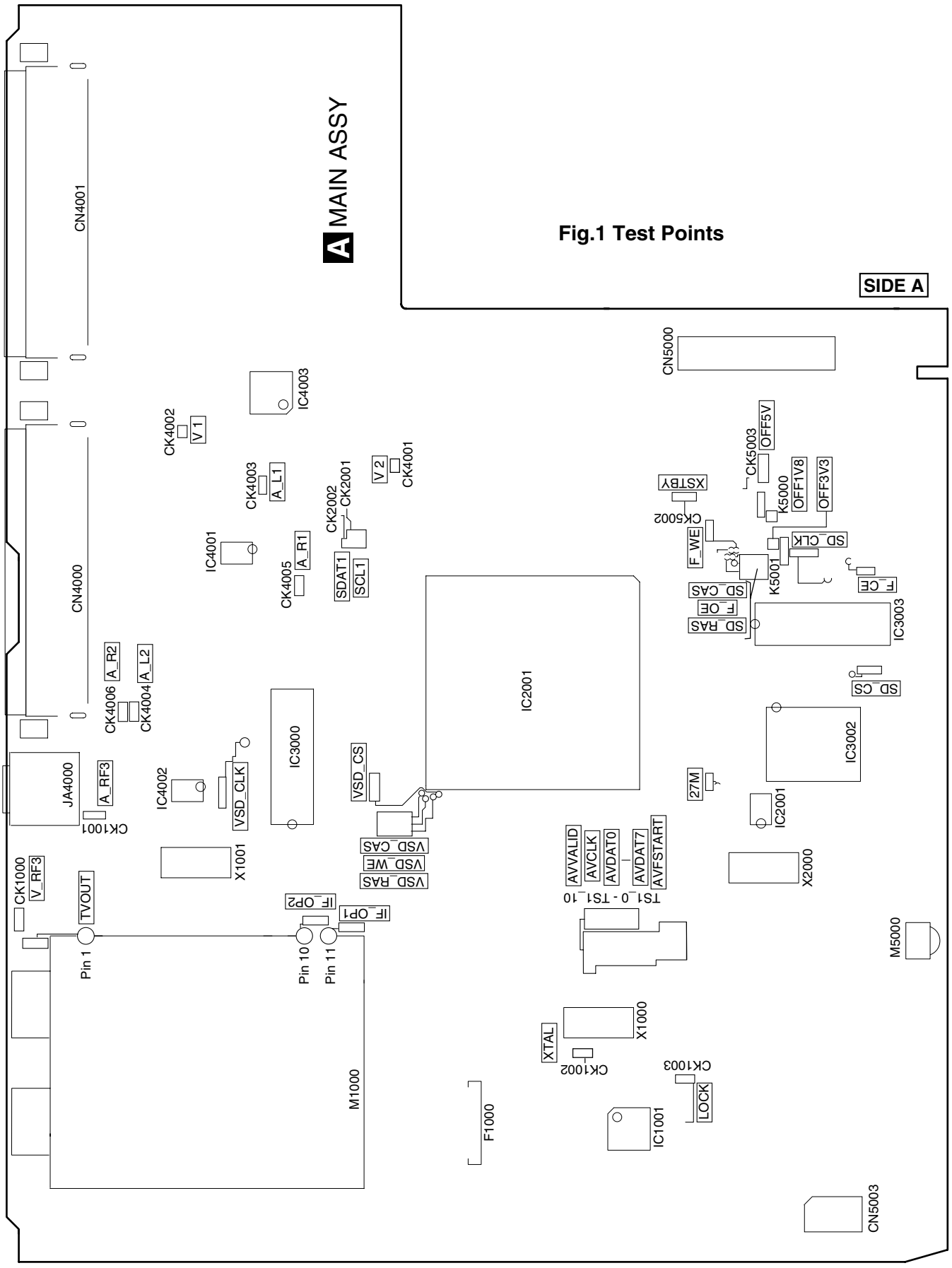
(4) Other Through Hole Points

Bus Line Name	Indicate	Description	Wave Form No.
EC2A	SD_RAS	RAS for IC3003 (SYstem SDRAM)	㉑ MAIN_3/5
EC3A	SD_CAS	CAS for IC3003	㉒ MAIN_3/5
EC4A	SD_WE	Write enable for IC3003	㉓ MAIN_3/5
EC1A	SD_CS	Chip select for IC3003	㉔ MAIN_3/5
EC0A	SD_CLK	Clock for IC3003	㉕ MAIN_3/5
	F_CE	Chip enable for IC3002	⑱ MAIN_3/5
EC8A	F_OE	Output enable for IC3002	⑲ MAIN_3/5
EC6A	F_WE	Write enable for IC3002	⑳ MAIN_3/5
	27M	27MHz clock for main system	⑩ MAIN_2/5
SD_XRAS	VSD_RAS	RAS for IC3000 (Video SDRAM)	⑬ MAIN_3/5
SD_XCAS	VSD_CAS	CAS for IC3000	⑭ MAIN_3/5
SD_XWE	VSD_WE	Write enable for IC3000	⑮ MAIN_3/5
SD_XCS0	VSD_CS	Chip select for IC3000	⑯ MAIN_3/5

(5) Other Points (Resistor)

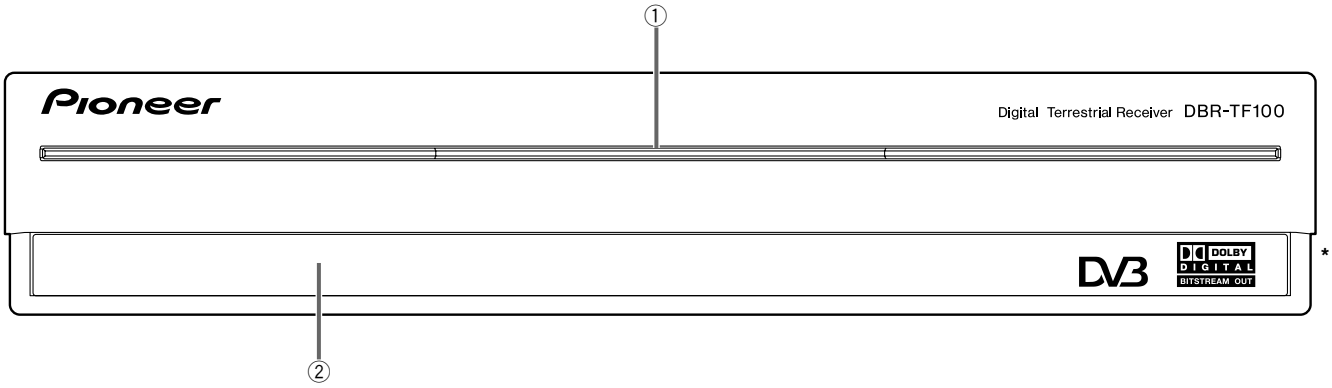
Signal Name	Indicate	Description	Wave Form No.
SD_CLK	VSD_CLK	Clock for IC3000	⑰ MAIN_3/5

Fig.1 Test Points



8. PANEL FACILITIES

Front view

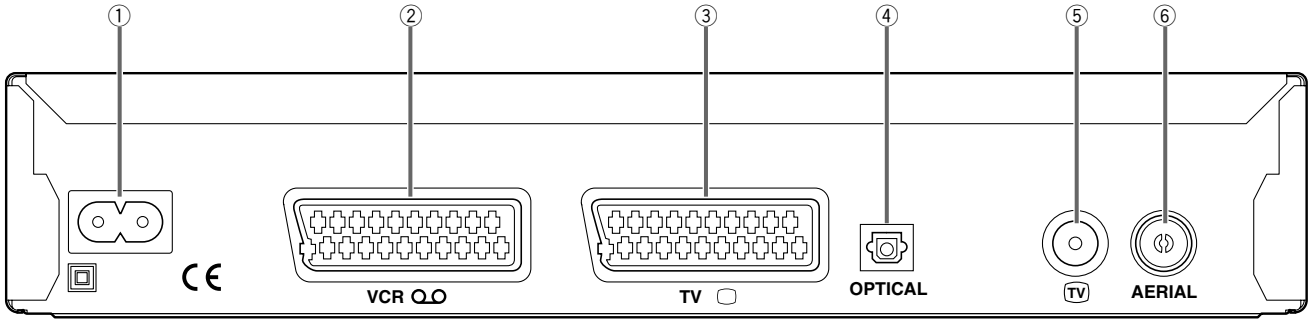


① **LED (standby/on)**
Shows the power status of the DTR; Red = Standby, Green = On. When a programme set by the timer is playing, the LED turns orange and it blinks when the remote is operated.

② **Infrared sensor**
Receives the signal emitted from the remote control.

* Dolby and the double-D symbol are trademarks of Dolby Laboratories.

Rear view



① **Mains lead socket**

② **SCART[1] socket for VCR**

③ **SCART[1] socket for TV**

④ **Optical digital audio output socket**

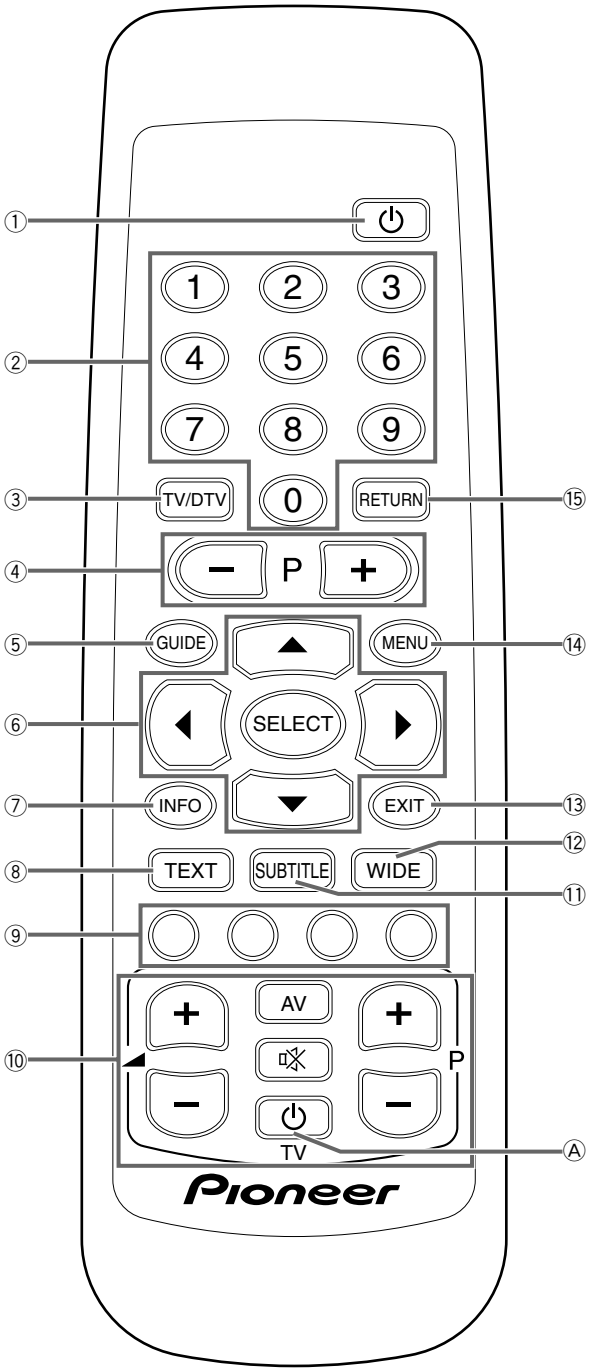
⑤ **VHF[2] and UHF[3] aerial output for TV**

⑥ **VHF[2] and UHF[3] aerial input, +5V to external antenna**

Note

1. **SCART**: Euroconnector
2. **VHF**: Very High Frequency
3. **UHF**: Ultra High Frequency

Remote control



① **STANDBY ⏻ button**
Press to switch the DTR between standby and power-on mode.

② **0–9 (Numeral) buttons**
- Press to directly select a channel.
- Used for Text Mode operations.

③ **TV/DTV button**
Press to switch between digital and analogue broadcasting.

Note
- This button only works when your DTR and TV are connected by a SCART lead.
- You may not be able to select some analogue TVs even when connected by a SCART.

④ **P (Programme) +, – buttons**
Press to select a channel.

⑤ **GUIDE button**
Press to display the Electronic Programme Guide (EPG).

⑥ **▲, ▼, ◄, ► buttons**
▲/▼/◄/►: Used for menu selections, Text Mode operations and when the channel list is displayed for programme selections.

◄: Used to take snapshots.

►: Press to turn alert on and off.

SELECT button
- While watching a programme, used to display the channel list.
- While the channel list is displayed, used to select a programme.
- While a menu screen is displayed, used to select menu items.

⑦ **INFO button**
Press to display the Info banner.

⑧ **TEXT button**
Press to select Text Mode.

⑨ **RED, GREEEN, YELLOW, BLUE buttons**
Used for Text Mode and on-screen operations.

⑩ **Refer to Setting TV codes on the right.**
This remote can directly control the TVs of major manufacturers. At the time of shipment the remote is preset to operate Pioneer TVs.

⑪ **SUBTITLE button**
Press to display subtitles.

⑫ **WIDE button**
Press to switch between wide-screen viewing modes.

⑬ **EXIT button**
Press to remove on-screen displays.

⑭ **MENU button**
Press to display the menu screen.

⑮ **RETURN button**
- Press to select the last displayed channel.
- Press to return to the previous menu screen.